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**PERSONALITY DIFFERENCES  
BETWEEN HIGH SCHOLASTIC APTITUDE-AVERAGE CREATIVITY  
AND HIGH CREATIVITY-AVERAGE SCHOLASTIC APTITUDE  
GROUPS OF COLLEGE STUDENTS**

**A Thesis  
Submitted to the Faculty of Graduate Studies through the  
Department of Psychology in Partial Fulfillment  
of the Requirements for the Degree of  
Master of Arts at the  
University of Windsor**

**by**

**RICHARD T. COMSTOCK  
B.A., Assumption University of Windsor, 1962**

**Windsor, Ontario  
1964**

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## **ABSTRACT**

A study was undertaken to investigate the personality differences between two groups of college students. One group received high scores on a scholastic aptitude test (S. C. A. T.) and registered at a low level on a test of creativity (Guilford's Alternate Uses Test). The other group, taken from the same overall population, attained high scores on the creativity test and low scores on the scholastic aptitude test.

By employing the Cattell Sixteen Personality Factor Questionnaire as a measuring device the groups were compared with respect to personality differences.

Of the sixteen personality factors measured by the Cattell Sixteen Personality Factor Questionnaire, three factors were found to differ significantly between the two groups. They were as follows:

- 1) The high creativity-average scholastic aptitude group was found to be more enthusiastic, talkative and surgent than the high scholastic aptitude-average creativity group who tended to be more glum, silent and desurgent.
- 2) The high creativity-average scholastic aptitude group was found to be more conservative and accepting than the high scholastic aptitude-average creativity group who were more experimenting, critical and radical.
- 3) The high creativity-average scholastic aptitude group was found to be more

dependent and imitative than the high scholastic aptitude-average creativity group who were more self-sufficient and resourceful.

Upon inspection, the results of the present study were found to be incompatible with those of previous research. This indicated the necessity for a re-evaluation of the psychometric instruments and the experimental design used in this investigation. It was concluded by the author that by including a wider variety of measurements and employing a more sophisticated experimental design in future studies, an adequate sample and better control of the variables would be possible.

## PREFACE

During the past decade probably as much psychological research has been carried out with regard to the numerous aspects of creativity as in all the years preceding. Considering the importance of the problem, and viewing the fact that most modern day methods of education emphasize the development of individual potential (Garrison, 1959), this experimenter was led to begin the present study. Seeking a more thorough knowledge of the creative personality and of how it differs from that of a person with high scholastic aptitude was the purpose of this investigation.

The author respectfully wishes to thank Dr. J. E. Callagan and Dr. A. A. Smith for their suggestions and assistance in the completion of this work. Gratitude is also due Mr. Meyer Starr M.A. and Mr. Robert C. Pinto M.A. for their patience and understanding in the preparation of the final draft of this thesis. A final mention must also be made regarding those professors and students who so willingly found time to participate in this experiment.

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## CHAPTER I

### INTRODUCTION

Over the years, various studies have been undertaken to investigate, as objectively as possible, the human quality of 'giftedness'. However, due to the research of Terman and his associates on the behavior of subjects with high I.Q. 's the term 'gifted' took on a limited meaning. This limitation is reflected in the definition of "gifted" as stated in Hinsie and Campbell's Psychiatric Dictionary (1960, p. 319): 'As used in child psychiatry, this term is meant to refer to a child whose intelligence is in the upper 2 per cent of the total population of his age. Often, however, the term is used more loosely to refer to a child who shows outstanding ability in any single area.' Subsequent research has, however, led to the conclusion that giftedness (in the wider sense) and high intelligence are not necessarily synonymous.

#### Limitations of Early Concepts

Early studies on giftedness were reviewed by Getzels and Jackson (1962). In conclusion, Getzels and Jackson emphasized the complex nature of "giftedness" and pointed out three major limitations in considering giftedness as synonymous with high intelligence.

First, it suggests that the common intelligence test samples all, or at least a sufficiently broad range, of known cognitive abilities. It thus discourages the observation of other types of cognitive functioning. On the contrary, the items on the typical intelligence test seemed to us to represent a rather narrow band of intellectual tasks, relying chiefly on those requiring in Guilford's terms 'convergent thinking' or neglecting those requiring 'divergent thinking'. To do well on the typical intelligence test, the subject must be able to recall and to recognize, perhaps even to solve; he need not necessarily be able to invent or innovate.

Second, although the correlation between the I.Q. and learning is positive--and we ought to say at once that we recognize the I.Q. as probably the best single measure we have--it nevertheless rarely accounts for more than one-quarter of the variance in such crucial factors as school achievement and academic performance. The student with a higher I.Q. who is doing poorly in school and the student with a lower I.Q. who is doing well appear too often for the I.Q. to stand as the only predictive measure of intellectual ability or as the sole criterion of giftedness. Moreover, it is commonly observed that many children who are very high in intelligence as measured by I.Q. are not concomitantly high in such other intellectual functions as creativity, and many who are high in creativity are not concomitantly high in intelligence as measured by I.Q..

And third, the I.Q. metric has been peculiarly immune to advances in our understanding of thinking and behavior. Despite significant transformations in our theories of cognition, learning, and problem solving, the conceptual base of the intelligence test has remained unaltered. The soundness of a new intelligence test is often measured by the degree of its correlation with an old test, that is, the test must measure the same mental processes as the old test. This perpetuates the original conception of intelligence and guards it from serious theoretical and empirical scrutiny. (Getzels & Jackson, 1962, p. 2).

Guilford (1956) believed that more attention should be given to the superior human adult in the investigation of intellectual qualities and functions. Previous studies, following Binet, had been very limited in their investigation of the scope and variety of intelligence. Guilford realized that a great number of dimensions are required to encompass the range of intellectual aspects of

human nature and suggested factor analysis as a possible method of investigating these aspects. He reported 40 known factors and suggested that a great many additional factors need to be studied before an adequate picture of intelligence can be established. Guilford claimed that forty, sixty or even a hundred factors would certainly be a smaller number of concepts than the number of possible tests or the number of observable types of activities of an intellectual character. In the forty factors discussed by Guilford, 7 memory factors and 33 thinking factors were included. The thinking factors involve cognitive (discovery), productive (convergent or divergent thinking) and evaluative mental activity which are of a figural, structural or conceptual nature.

Guilford suggested that the term intelligence has never been defined uniquely or satisfactorily. He felt that as to general terminology, intellect can be meaningfully defined as the system of thinking and memory factors, functions and processes. Guilford continued to explain that on an I.Q. test, when many factors are present, the composite score based on all items can measure each component only to a small degree if they are equally weighted in the composite. He claimed that a Stanford Binet I.Q. or any I.Q. from a test whose components are predominately verbal is based mostly on a verbal-comprehension factor thus reducing the effectiveness of other factors which might be represented in the scale. In non-verbal tests there is less domination by a single factor but variation still results from one battery to another.

There is evidence, therefore, to indicate that giftedness is not necessarily identifiable with high intelligence and that intelligence is of a more

complex nature than is assumed by standard tests of intelligence. It is from the obvious limitations of the present concept of intelligence, as indicated above, that recent research has concentrated on other intellectual functions as expressed in scholastic aptitude and creative ability.

### The Concept of Creativity

As pointed out in Sprecher (1963), 'creativity' is not an unequivocal term. However, various definitions have been attempted and are commonly accepted. Drever (1952, p. 54) defines creative as follows: 'Producing an essentially new product, . . . ; used of imagination where a combination of ideas or images is constructed (strictly when it is self-initiated rather than imitated); also of thought synthesis where the mental product is not a mere summation.'

Guilford (1950), in attempting to define creativity, stated that primary ability is the most essential factor for an individual to be creative. However, concerning the productive aspect of the creative person, he claimed that "Whether or not the individual who has the requisite abilities will actually produce results of a creative nature will depend upon his motivational and temperamental traits. To the psychologist, the problem is as broad as the qualities that contribute significantly to creative productivity. In other words, the psychologist's problem is that of creative personality." As a final remark he claimed that "A creative pattern is manifest in creative behavior, which includes such activities as inventing, designing, contriving, composing, and planning. People who exhibit these types of behavior to a marked degree are recognized as being creative." (Guilford, 1950, p. 444).

Harriman's Encyclopedia of Psychology (1946) and Taylor's "The Nature of the Creative Process" (1959) both define creative thinking from the point of view of stages. These stages, which had been recognized by Helmholtz (1896) and Poincaré (1908), were later defined by Wallas (1926). As stated in the Encyclopedia of Psychology (1946) no further details were given with respect to the early recognition of these stages by Helmholtz and Poincaré. With regard to the definition, however, Harriman speaks of four stages viz. preparation, incubation, illumination (or inspiration) and elaboration (or verification). In the first period (preparation) the subject assembles or receives new ideas by gathering together his raw material. Incubation follows where the problem is laid aside and no voluntary work is done on it. Eventually renewed attention to the problem results in a prompt solution or at least a prompt advance beyond the previous stage of mastery. The third stage (illumination) occurs when the idea becomes definitely related to a specific goal, resulting in the completion of the essential structure. Finally, in the elaboration stage, the idea is revised and given the finishing touches. Although these periods are distinguished in thought process they may overlap. The length of these stages also varies between persons and thoughts.

The above writer also made a distinction between creative thought and fantasy as follows: "Creative thought is differentiated from the type of imaginative activity found in reverie or daydreaming in that it is directed by a purpose or goal" (Harriman, 1946, p. 110).

Schachtel (1959) saw openness toward and interest in outside objects



and events as being part of the creative process. This openness allows for more direct perception of the world itself, instead of just the labels attached to objects and events. He also claimed that the particular overt characteristics of the individual may vary from time to time depending upon which quality is playing the dominant role in any creative experience (e.g. intelligence or originality).

Taylor and Barron (1963) made a distinction between creativity and productivity. They claimed that productivity need not require originality but creativity as found in the creative scientist, for instance, involves both originality and productivity. In discussing the nature of creative thinking these authors listed the following as being prerequisites for a creative scientist:

- 1) highly developed intellectual ability, being orderly, thorough and disciplined in his acquisition of current knowledge,
- 2) an open mind (cf. Schachtel, 1959) which pays attention to things which appear discordant and contradictory and attempts to find new principles which will restore order,
- 3) an independence of judgment and an ability to stand his ground in the face of criticism,
- 4) a commitment to and respect for the unreasonable.

Spearman (1930) surveyed views on creativity current at the time. He quoted from Ravaissou: "Genius, by the admission of everyone, consists above all in inventing, in creating," and also Gerard: "Genius is properly the faculty of invention; by means of which a man is qualified for making new

discoveries in science or for producing original works of art." (Spearman, 1930, p. 6).

Within the psychoanalytic frame of reference, Zilboorg (1959, p. 25) referred to diversity and adversity with respect to the creative life stating: "We must remember that the psychology of the creative person is the psychology of a person who walks around in life, who looks, and sees, and feels, who takes into account what life is and, somehow or other, wants to get out from the fetters in order to express something that he has within himself."

Experimental studies have shown, beginning with a paper by Newell, Shaw and Simon (1962), the relationship between creativity and problem solving. These authors feel that problem solving is called creative to the extent that one or more of the following conditions are satisfied:

- 1) The product of the thinking has novelty and value (either for the thinker or for his culture).
- 2) The thinking is unconventional, in the sense that it requires modification or rejection of previously accepted ideas.
- 3) The thinking requires high motivation and persistence, taking place either over a considerable span of time (continuously or intermittently) or at a high intensity.
- 4) The problem as initially posed was vague and illdefined, so that part of the task was to formulate the problem itself.

Thus, creative activity (at least in the sciences) appears to be a special class of problem-solving activity characterized by novelty, unconventionality, persistence, and difficulty in problem formulation. (Newell, et. al, 1962, p. 65).

Parnes and Meadow (1963) studied 350 students enrolled in a creative problem-solving course at the University of Buffalo. They found that training students in the use of "deferred-judgment" for problem solving increased the students production of ideas both in quantity and quality on creative ability

tests. The criterion used to measure quality of ideas in these tests was not mentioned by the authors.

A study was undertaken by Drevdahl (1956) investigating particular factors which were assumed to be associated with creative individuals. He used graduate students, who were classified into creative and non-creative groups and also science and arts groups (the former on the basis of ratings made by the faculty members of the University of Nebraska), and found no significant difference between the groups on a factor of "spontaneous flexibility." This is an interesting finding, for "spontaneous flexibility" is the factor measured by the Alternate Uses Test, the test used in this particular study (experimental design, p. 20).

#### Personality Characteristics and Creativity

A great deal has been written and many studies have been carried out investigating the relationship between creative ability and personality traits.

Stein (1963) felt that psychologists have tended to minimize the significance of the social milieu created by the individual himself. In his study, he placed emphasis on the human person's ability to alter his environment, and thus, actualize his own needs and potentialities. Stein postulated that creativity consists of processes that occur within the individual which are the result of social transaction. This transaction, which consists of all the social interactions of the individual with his environment, either encourages or inhibits creativity in adult life, depending on whether novel work was accepted as tenable, or useful, or satisfying by a group at some point in time.

Dealing with the psychological factors, Stein saw the creative person as having a more integrated personality; being exposed to a more complex parent-child relationship which was resolved early in life by detachment, self-reliance and a greater involvement in outside objects; exhibiting the independence of an individual whose own value-hierarchy determines his behavior; and displaying more self-confidence and perseverance.

Stein studied industrial research chemists in an attempt to validate his hypotheses. The selection of subjects was made by the ratings of superiors and later corroborated by ratings from colleagues and subordinates. The ability to discover, systematize and communicate knowledge was the criterion by which these subjects were rated. The creative subjects reported themselves as being more distant from either parent and from adults in general; as having parents who were more inconsistent in their attitudes toward them; and as having engaged in solitary activities early in life.

A final observation which Stein made concerned the present psychological status of creative subjects. The creative subjects were found:

- 1) to be autonomous individuals, more different from their colleagues;
- 2) to possess attitudes which suggest that they strive for distant goals;
- 3) to have a greater number of integrated attitudes;
- 4) to be cautious and realistic;
- 5) to be consistent in their desires for rewards;
- 6) to have a more differentiated value-hierarchy;
- 7) to regard themselves as assertive, authoritative, and possessing leadership qualities or abilities.

Crutchfield (1962) compared the personalities of the conforming individual and the non-creative individual, and the personalities of the independent individual and the creative individual. He cited three studies carried out at the Institute of Personality Assessment and Research in Berkeley, California. In these studies, the conformity of the individual subjects in three separate groups was tested.

The criterion of conformity for the first two groups involved perceptive judgment. The subjects were required to say which of two stimuli flashed on a movie screen was larger. A conformity percentage was determined by noting the number of responses in which the subject used the group response to determine his reaction instead of relying on his own perceptive judgment. The third group was given a conformity scale empirically derived from those items of a personality inventory which significantly differentiated between architects who yielded most to experimental group pressure and those who yielded least.

The first group consisted of 34 full-time research scientists between the ages of 25 and 54 years--17 rated as more highly original and 17 rated as less highly original. When the conformity test was administered, the more highly original group achieved a conformity score of 10% while the less highly original group obtained 18%. The significance of these percentages and other pertinent information describing the subjects was not given by Crutchfield in his review of the study.

In the second group were 24 senior women at Mills College. Twelve were rated by the faculty as high in creative ability. A comparison group of 12

seniors, matched with the creative group for field of study, was selected at random from the rest of the senior class, and similarly assessed. On the same conformity test the highly creative group scored 23% while the average group scored 41%. Again, the significance of the differences between these percentages was not included.

The third group consisted of 40 American Architects nominated as most highly creative in their profession. On the conformity scale, this highly creative group was found to have a statistically significant lower mean conformity score than 84 other architects not nominated for being original.

In summary, these studies appear to give strong supporting evidence for the existence of a negative correlation between conformity and creativity. Crutchfield concluded that "Taken together, these findings from current studies of creative persons and the other findings on personality attributes of conformists offer consistent evidence for a significant empirical relationship between conformity tendencies in the person and lack of manifest creativity." (Crutchfield, 1962, p. 135).

The artistic preferences of creative as compared to non-creative subjects was studied by Barron (1958). He found that artists from various cities and scientists (the latter, Ph.D. candidates at the University of California, rated by the faculty members on the dimension of originality) preferred drawings that were categorized as being disorganized by another group of Ph.D. candidates who had low scores on the same originality dimension. The apparently unstructured type of drawing was more stimulating to the

creative subjects than the figures which were simple and more symmetrical.

Barron claims that:

The creative not only respects the irrational in himself, but courts it as the most promising source of novelty in his own thought. He rejects the demand of society that he should shun in himself the primitive, the uncultured, the naive, the magical, the nonsensical; that he must be a 'civilized' member of the community. Creative individuals reject this demand because they want to own themselves totally, and because they perceive a shortsightedness in the claim of society that all its members should adapt themselves to a norm for a given time and place. (Barron, 1958, p. 163).

Barron (1963a) mentioned that 'boriginal' persons prefer complexity and some degree of apparent imbalance in phenomena and manifest a greater personal scope, independence, self-assertiveness and dominance. Finally, the creative person rejects suppression as a mechanism for the control of impulses.

Barron doesn't enlarge on this but it is possible that persons who he considers original utilize impulse energy in a more constructive, positive manner. In this way energy would not be wasted as in turning it inward or denying it expression.

In another article by Barron (1963b) the creative person's need for complexity and a preference for disorder was emphasized. He uses the Webster's Dictionary definition of 'disorder' i. e. 'The want of order or regular disposition; immethodical distribution; confusion; neglect of rule; irregularity.' In his general approach to the problem of creativity, Barron claimed that creative subjects show more concern for the object. For instance, they tend to place special emphasis on the component parts of the whole as well as the whole itself, thus giving the assumed an essential meaning. He suggested that

creative persons are more independent in thought, suffering great personal pain if their cause demands it. Their lives are more complex, filled with a tension which when discharged provides pleasure. The impulse life of the creative individual is rich and he allows it to express itself more in the interest of truth.

### Projective Test Studies

Projective tests have often been used to assess the personality traits of creative persons, and to discover potential creative ability in other subjects.

Munsterberg and Musson (1953) investigated the personality structures of art students. On the basis of earlier studies investigating the personality of the artist seven hypotheses were set up. These considered the artist as being seen in conflict with his parents, of having overt aggressive tendencies, possessing intense guilt feelings, being introverted and living a rich inner life, displaying a strong need for creative self-expression, reflecting need for acceptance of his work but not strong personal success and acceptance and, finally, exhibiting as unwillingness to comply to home standards.

In testing these hypotheses Munsterberg and Mussen employed 30 subjects who were outstanding art students at Ohio State University recommended by their instructors on the basis of the originality and promise of their work. Thirty non-art majors from other various fields of study at the University were matched with the experimental group for age, sex and year in college. Ten T.A.T. cards were then administered to all 60 subjects. Chi-square tests were used to determine whether or not each of the relevant T.A.T. and questionnaire categories appeared in a significantly greater number of the records of subjects



of one group than of the other. Of the 52 chi-squares computed, 16 were found at the 5 per cent level of significance or better. Five more chi-squares were found at about the 10 per cent level of significance. With respect to these results the authors claimed:

Six of the seven hypotheses were at least partially supported. Although there was no evidence that more artists than non-artists experience conflict with their parents, there was evidence that these conflicts are handled differently by members of the two groups, more of the non-artists showing overt aggression as a reaction to the conflict, more of the artists leaving home in response to it. (Munsterberg & Mussen, 1953, p. 465).

Stein and Meer (1954) used 18 industrial research chemists (rated by their colleagues and superiors on the global variable creativity) and investigated their responses on Rorschach cards utilizing four different levels of exposure time to the cards. Their findings were as follows:

As exposure level became longer, the difference in autistic responses between the high and low subjects disappeared (8 per cent as against 4 per cent) while the difference in well-integrated responses between the two groups increased (41 per cent as against 16 per cent).

The overall analysis showed the "highs" achieved significantly more well-integrated responses than the "lows" (.001 level of confidence). (Stein & Meer, 1954, p. 42).

On the basis of the possibility that the differences were due to intelligence, Wechsler-Bellevue Full Scale Scores were correlated with creativity scores and with Rorschach scores for all the subjects. The effects of intelligence were then partialled out. Most of the variance which remained was identified as indicating a relationship between creativity and Rorschach responses. From this finding the authors suggested that there were factors other than intelligence operating in creative activity. For instance, it was felt that the difference

between the two groups was a function of personality factors viz. defensiveness or overcriticalness, which was inhibiting the development of possible responses to the stimulus cards.

Griffin (1958) used the Levy movement blots, (a technique devised by David Levy with the express purpose of eliciting movement), and investigated the relationship between movement responses and creativity. She selected as subjects 40 college women--20 rated as highly creative by at least one teacher and two students and 20 who matched the creative group in so far as possible in age, sex, year in college, and intelligence (measured by The American Council On Education Psychological Examination [A. C. E.]) and were rated by at least one teacher and two students as non-creative. In this study every effort was made to secure students from all major departments.

Once the Levy Test was administered to all the subjects the mean scores and differences, standard deviations and critical ratios on its 21 movement scales were computed. Using the method of 'rank scores,' t test and chi-square technique a significant difference beyond  $p = .05$  level of confidence was found on only one out of the 21 movement scales viz. 'control of movement.' In this study, negative findings seemed to question the classic Rorschach interpretation of having M scores signify 'a more individualized intelligence' and thus greater creative ability. Griffin quoted Buchard's (1952) conclusion that "We cannot reach the secret of creativity by counting M's." (Griffin, 1958, p. 136).

The difficulty in using projective techniques as measures and detectors

of creative ability was pointed out by Bellak (1958). Bellak felt that the need for a specific mental set, and a special motivation on the part of the subject when taking the tests impeded making inferences about creative ability. Weaknesses inherent in the tests themselves, according to Bellak, are the limited range of configurations represented and the low inter-individual validity.

More objective studies have also been carried out with respect to the personality of creative individuals. For example, there have been a number of studies using the Cattell Sixteen Personality Factor Questionnaire. Many of these studies have yielded significant results. The test in its evaluation of personality is better standardized than the projective techniques and its validity and reliability are known (experimental design, p. 24).

Reid, King and Wickwire (1959) studied the cognitive and other personality characteristics of a sample of 48 seventh grade children. This sample included two groups of subjects matched for sex, and family status-- 24 nominated by their peers as creative and 24 nominated as non-creative. The authors found that the creative children tended to be more cyclothymic than schizothymic as tested by the Cattell 16 P.F..

Drevdahl (1956) used graduate students who were divided into creative and non-creative groups (on the basis of ratings made by the members of the University of Nebraska) and also science and arts groups. Employing Cattell's Sixteen Personality Factor Questionnaire (1952), Drevdahl found that the creative subjects scored higher than the non-creative group being more radical and self-sufficient; and lower than the non-creative subjects being more

schizothymic (cf. Reid et al. , who obtained opposite results with a child population), and, desurgent. The arts group was characterized as differing significantly from the science group scoring higher on factors of emotional sensitivity and bohemianism.

Drevdahl and Cattell (1958) investigated the dimensions of creativity in artists and writers. The subjects used in this study were practicing and productive artists and writers, well known in their fields and selected for inclusion by committees of university art faculties, librarians and editors. The artists were selected from 'Who's Who in American Art' while the writers were taken from a list of professionals who had published extensively in the past decade and whose work had sold well.

When the Cattell personality scores of these artists and writers were compared with the normal or standardization group, they were found to be more intelligent, emotionally mature (ego strength), dominant, adventurous, emotionally sensitive, bohemian, radical, self-sufficient and subject to group standards and control. At least ten of the sixteen factor tendencies which he reported were similar to those possessed by a scientist population described as creative by Cattell in a further study (1963).

In this study, Cattell (1963) administered the Sixteen Personality Factor Questionnaire to subjects who were engaged in scientific research (biologists, chemists, physicists). From the results, Cattell concluded that the more introverted subjects had higher scientific (and philosophical) productivity. He felt that the schools should place more emphasis on recognizing the abilities of

introverted students. Cattell then implied that creativity cannot be achieved by adjusting the curricula, for all the evidence indicated that it was primarily determined by personality and values, not cognitive skills.

#### **Problem of the Present Study**

The reviewed previous research has shown that:

- a) The concept of intelligence as tested by orthodox intelligence tests is inadequate and has severe limitations.
- b) Scholastic aptitude and creative ability are also significant factors to be noted in investigating all around intellectual functioning.
- c) Creativity and intelligence cannot necessarily be equated.
- d) Creative and non-creative subjects differ significantly on a number of personality dimensions viz. creative subjects are found to be more self-confident, persevering, autonomous, realistic, cautious, self-assertive, authoritative, sensitive, dominant, cyclothymic, intelligent, emotionally mature, adventurous, bohemian and radical than non-creative subjects.

It is not clear from this research, however, that creative subjects as distinct from subjects with high scholastic aptitude differ significantly with respect to personality.

The present study is designed to investigate this problem. Specifically, does the personality test performance of a group of highly creative subjects differ significantly from a group of subjects characterized primarily by high scholastic aptitude.

## CHAPTER II

### DESIGN OF EXPERIMENT

#### Selection of Subjects

A scholastic aptitude test (S.C.A.T.) and a creativity test (Guilford's Alternate Uses Test) were administered to a group of male and female college freshmen (N=218) registered in either the arts or science course at the University of Windsor. Variability due to chronological age differences was controlled by restricting the students to the age range of between 17-22 years.

It has been suggested by the research reviewed above that orthodox I.Q. tests are inadequate and have severe limitations in measuring overall intelligence. The Cooperative School and College Ability Test (S.C.A.T.), measuring scholastic aptitude, was chosen instead of an I.Q. test since it measures specific verbal and quantitative abilities acquired mostly in school. The authors have deliberately designed and constructed the tests making up the S.C.A.T. to avoid any inference that they measure 'I.Q.' or 'mental development'. With respect to the validity of this test, a correlation of .65 has been found between aptitude scores and school grades (S.C.A.T. Manual, 1955). The reliability of the S.C.A.T. has also been indicated in the S.C.A.T. Manual for samples of high school seniors and college freshmen and correlations in the region of .90 were obtained.

The Alternate Uses Test was suggested by Guilford in a personal communication to the writer. This was suggested as being an adequate single measure of creative ability. In the Guilford Alternate Uses Manual (1960), the validity and reliability of this test, which is essentially one of spontaneous flexibility, is assessed as follows:

In adult samples the factor loadings for the factor of spontaneous flexibility (factor DMC in the Guilford structure-of-intellect model) have been .51 and .52 for the Unusual Uses Test. A significant secondary loading has also appeared in the factor of originality (factor DMT in the structure-of-intellect model) with a range of .30 to .46.

In samples of young adults with I.Q.'s ranging above average, the original form of this test, Unusual Uses, has had reliability estimates from .68 to .81. In four samples of 9th-grade students the estimates have been from .62 to .85.

In computing the total score achieved by each subject for the Alternate Uses Test an arbitrary judgment was involved in the evaluation of responses. This subjective aspect was overcome by utilizing a system of inter-judge reliability. The ratings for this test were made independently by the author and one other judge. The majority of the scores were agreed upon by both judges. However, where there was disagreement, the judgment of the experimenter was final.

The relationship of the two variables of creativity and scholastic aptitude, which might influence the performance of the subjects on the Cattell personality test, is indicated by the scatter diagram as shown in Fig. 1; (N=218). The test scores measuring scholastic aptitude and those measuring creativity from an inspection of this scatter diagram suggests low correlation and a

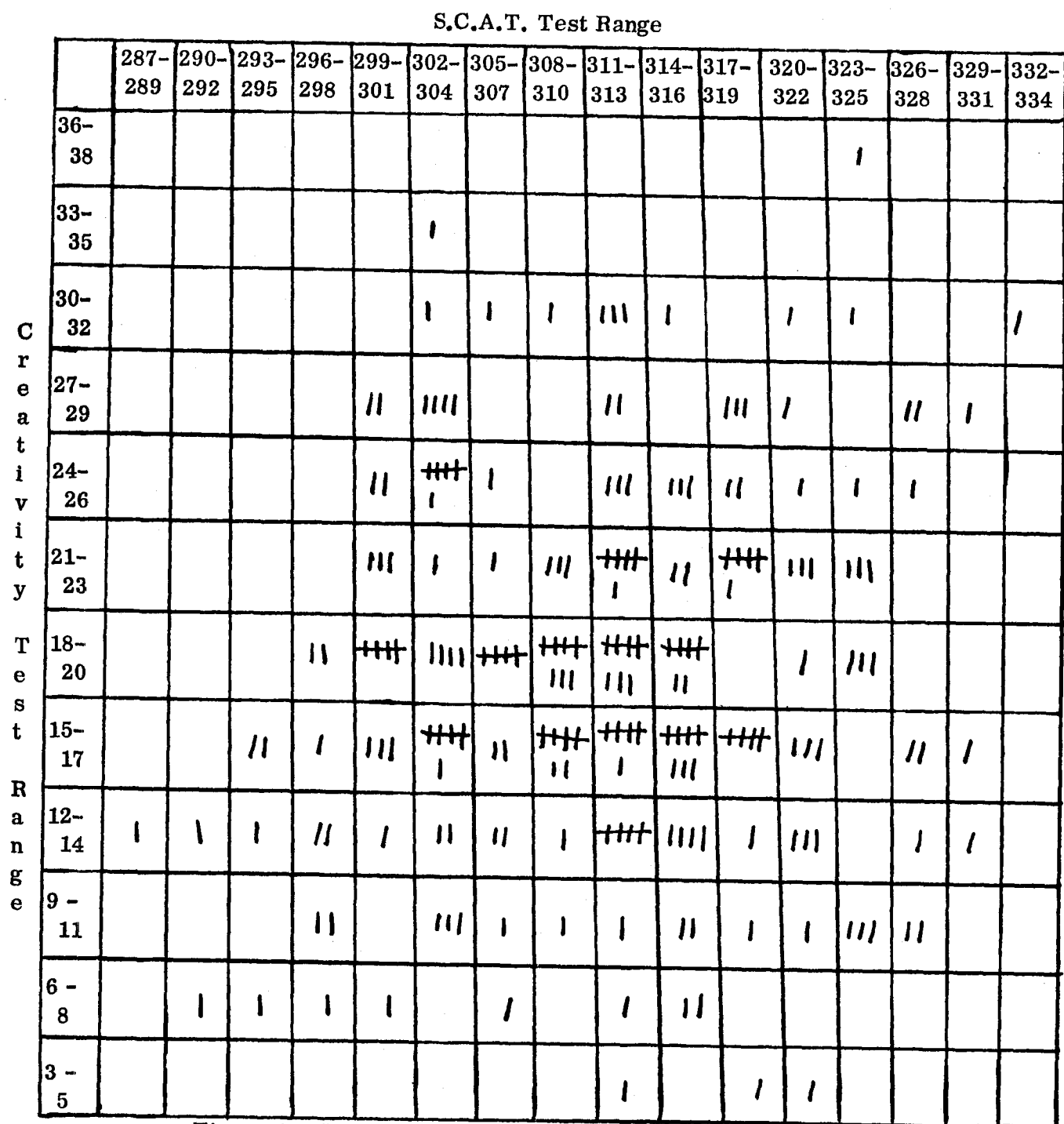


Figure 1. Scatter Diagram Frequency Tally of Creativity Scores and Scholastic Aptitude Scores for Total Population (n = 218).



relative independence of the variables concerned.

### Method

On the basis of the test results, two groups of subjects were formed viz. a group with high scores on the scholastic aptitude test and a group with high scores on the test of creativity, respectively. High scholastic aptitude group--criterion of selection: subjects with scores in the top 40% on the scholastic aptitude test and possessing scores below the top 75% on the test of creativity. Creativity group--criterion of selection: subjects with scores in the top 20% on the test of creativity and scoring below the top 70% on the scholastic aptitude test.

Previous inspection of the data indicated that the criterion for the selection of groups be chosen arbitrarily. The percentages of the criterion of selection were determined in part as a result of the need for an adequate number of subjects in each of the two groups. Since there were more students with high creativity and low scholastic aptitude than subjects with high scholastic aptitude and low creativity the selection percentages had to be adjusted accordingly to provide adequate samples while still avoiding the overlap between the groups.

Using the above criteria, two groups were selected consisting of 17 subjects (8 male, 9 female) classified as highly creative and of average scholastic aptitude; and 17 subjects (9 male, 8 female) who were of high scholastic aptitude and had average creative ability.

Table 1 includes the mean, standard deviation and range for age, S.C.A.T. and creativity scores for each group. The large difference between

Table 1

Mean, SD and Range for Age, S. C. A. T. and Creativity  
Scores for Each Group

	High Creative Group			High Scholastic Aptitude Group		
	Mean	SD	Range	Mean	SD	Range
Age	18.82	1.15	17-21	18.76	1.26	17-22
S. C. A. T.	302.71	1.27	301-305	321.41	4.31	314-330
Creativity	27.53	2.87	35-36	10.59	3.24	3-14

the SD of S. C. A. T. scores for the two groups can be explained by noting two factors. First, the cut-off points for the criterion of selection vary in such a way as to influence the SD. Since the cut-off point for the scholastic aptitude group is the top 40% while for the creativity group it is the lowest 30% a wider range exists for the former group. This factor would account for some of the difference. The remaining difference is possibly due to the selective system employed in granting college entrance to the students concerned. The original distribution included a much larger sample. The lowest score for acceptance to college would thus come in the lower middle range of the original distribution. This could account for the homogeneity of the S. C. A. T. scores for the creative group and not the scholastic aptitude group.

#### Procedure

The Cattell 16 P. F. Form A (see appendix) was administered to each of the subjects in the two experimental groups, the raw scores being converted to sten scores using the college male and female standardization tables (Cattell,

1957). The validity, reliability and factorial structure of this test has been adequately demonstrated in previous research, presented by C. J. Adcock in *Buros Mental Measurements Yearbook* (1959, p. 198) as follows:

This test has 16 or 17 scores . . . . Split half reliabilities ( $n=450$ ) range from .71 to .93, ten coefficients being above .80. This is quite good; but even more pleasing is the fact that validities (based on factor loadings) range from .73 to .96 with eleven coefficients exceeding .80.

For a multi-dimensional test of this kind one could not hope for much more. Evidently, despite the reputation of questionnaire methods as unreliable, this test does succeed. It should be noted, however, that the structure of the test does not require that the questions be taken at their face value. They are considered as stimulus variables, and a variable is assigned to a factor measure not because of its meaning but because of the usual mode of response to it. Of course, any questionnaire is subject to deliberate distortion and some check on this is desirable.

The above estimates for the reliability and validity of the Cattell 16 P.F. are for Forms A and B taken together as one test. Only one form of the 16 P.F. (Form A) was used in this investigation, however, and this involved a reduction in the number of items available in measuring the same 16 factors of the personality inventory. In the Cattell Manual the reliability estimates for Form A used alone are said to be very close to those of Forms A and B taken together on all 16 factors. The validity estimate for a single form is not given in the Manual, but it is suggested as being slightly lower than for Forms A and B together.

## Analysis

### The Hypothesis Tested:

A highly creative (average scholastic aptitude) group of subjects

differs significantly from a group characterized by high scholastic aptitude (average creative ability) with respect to personality as measured by their performance on the Cattell 16 P.F..

Using the analysis of variance technique (Winer, 1962, p. 302) the null hypothesis that there is no significant difference between the two groups was tested.

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## CHAPTER III

### PRESENTATION AND ANALYSIS OF RESULTS

#### Main Statistical Analysis

The 16 P.F. mean sten scores of the high creativity and high scholastic aptitude groups are listed in Table 2. A graphic representation of these results in the form of a profile is given in Figures 2 and 3.

Table 2

#### Mean Sten Scores for Both Groups

	High Creativity Group	High Scholastic Aptitude Group
Factor A	5.88	5.12
B	5.47	6.47
C	5.88	4.94
E	5.82	4.65
F	7.12	5.06
G	4.41	5.18
H	5.41	5.12
I	4.65	5.71
L	6.59	6.06
M	6.53	6.29
N	5.94	5.59
O	5.82	6.06
Q1	4.71	6.06
Q2	5.29	7.35
Q3	4.53	5.29
Q4	6.41	6.24

The corresponding profile of the mean sten scores for factors A-I can be found in Figure 2.

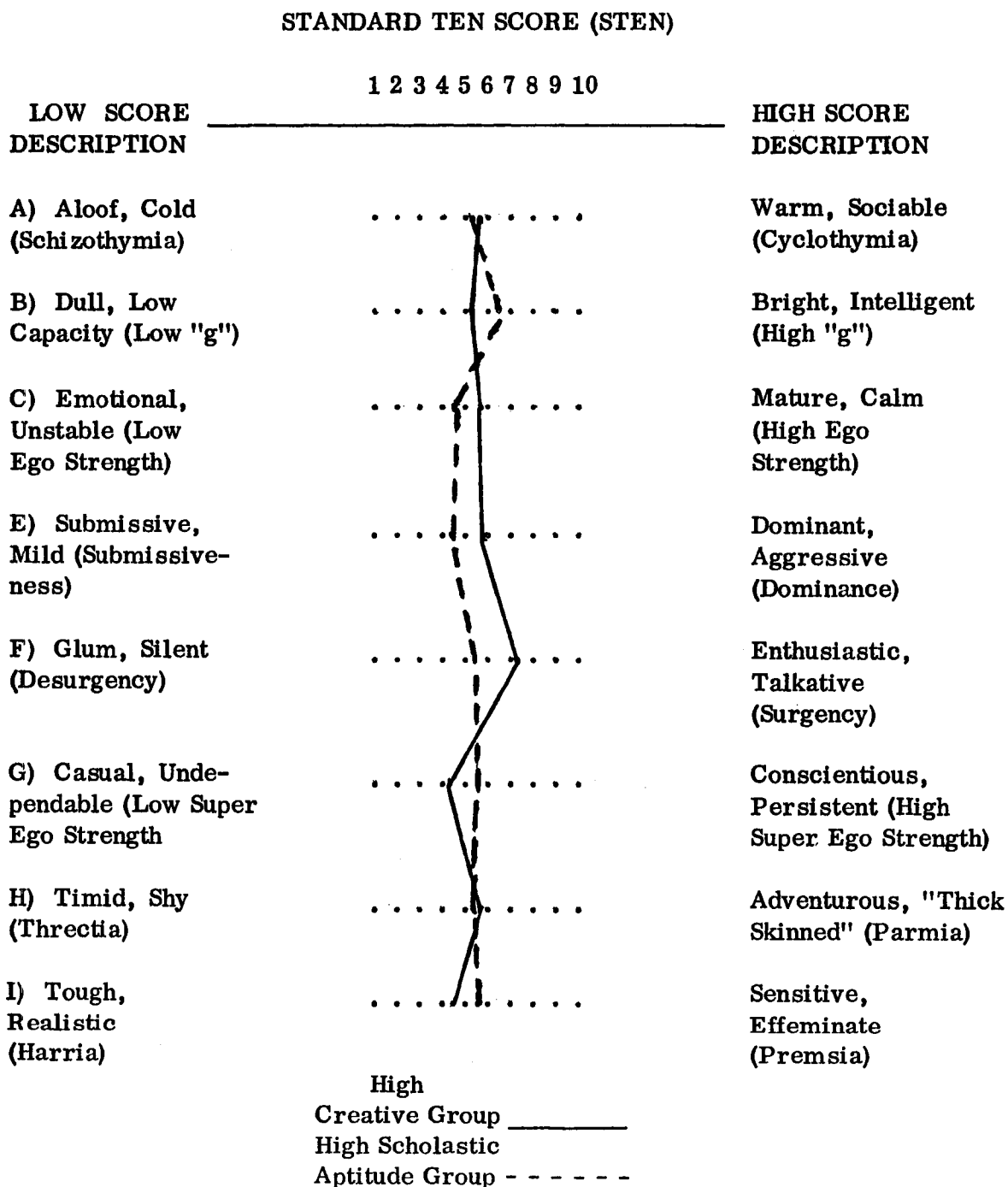


Figure 2. Mean Sten Scores of High Creativity and High Scholastic Aptitude Groups for Factors A - I.

The corresponding profile of the mean sten scores for factors L-Q4 can be found in Figure 3.

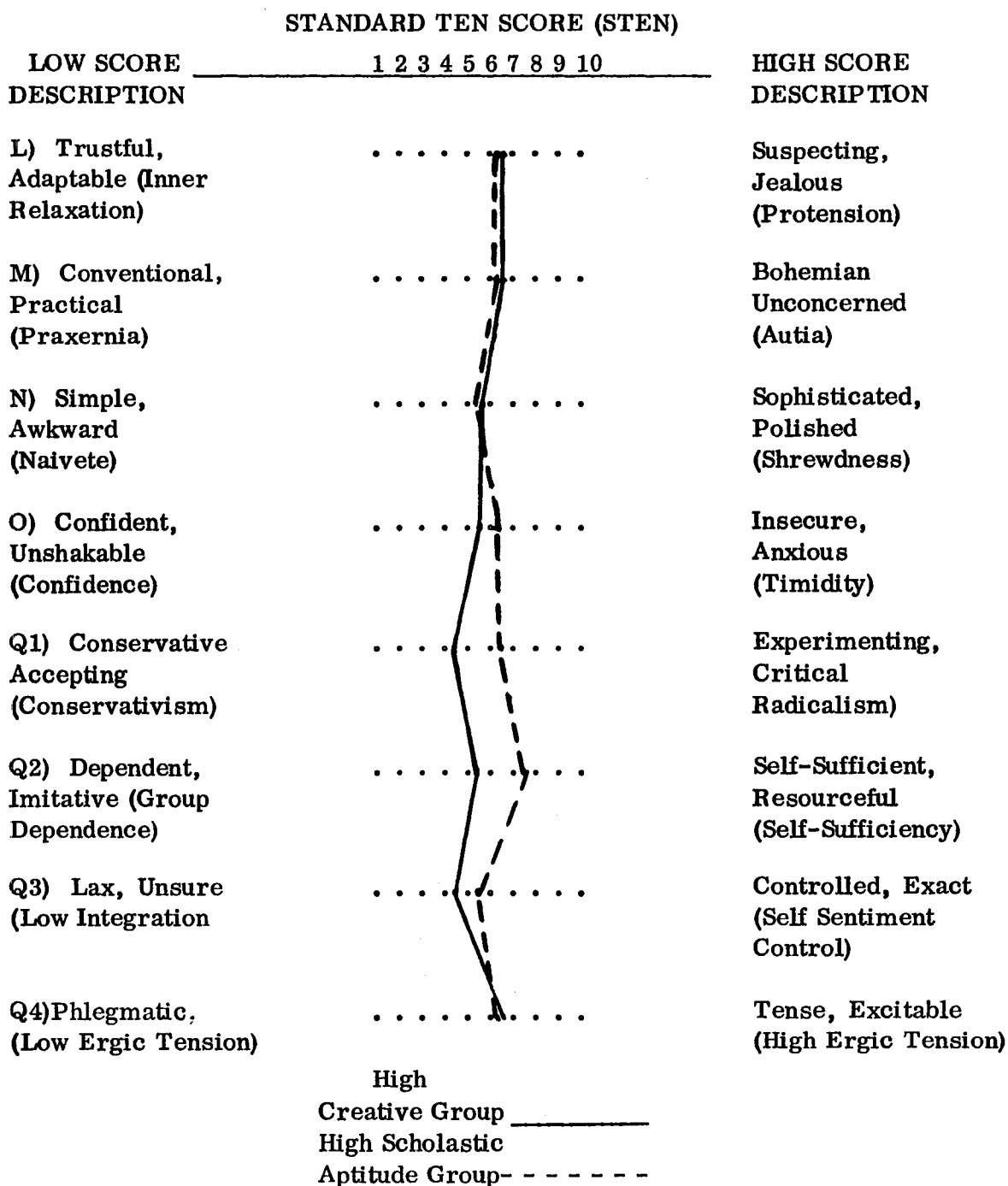


Figure 3. Mean Sten Scores of High Creativity and High Scholastic Aptitude Groups for Factors L-Q4.

The mean sten score differences of the high creativity and high scholastic aptitude groups were then analyzed by the analysis of variance technique (Winer, 1962, p. 302). The results of this analysis are shown in Table 3. The distribution of creativity scores (Figure 4) shows a slight positive skew but this would not be sufficient to invalidate the assumptions underlying the analysis of variance technique.

Table 3

Analysis of Variance  
For Numerical Table

Source of Variation	SS	df	MS	F
<u>Between Subjects</u>	149.9338	33	4.5434	
G				
(Between groups)	.2647	1	.2647	
	149.6691	32	4.6672	
<u>Within Subjects</u>	2209.1250	510	4.3316	
F				
(between factors)	146.0588	15	9.7372	2.44*
GF				
(groups and factors	144.9706	15	9.6647	2.42*
interaction)	1918.0956	480	3.9960	
-----				
*P .01 = 2.04				

The analysis indicates that significant F values at the .01 probability level were found for the 'between factors main effect' and for the 'groups and



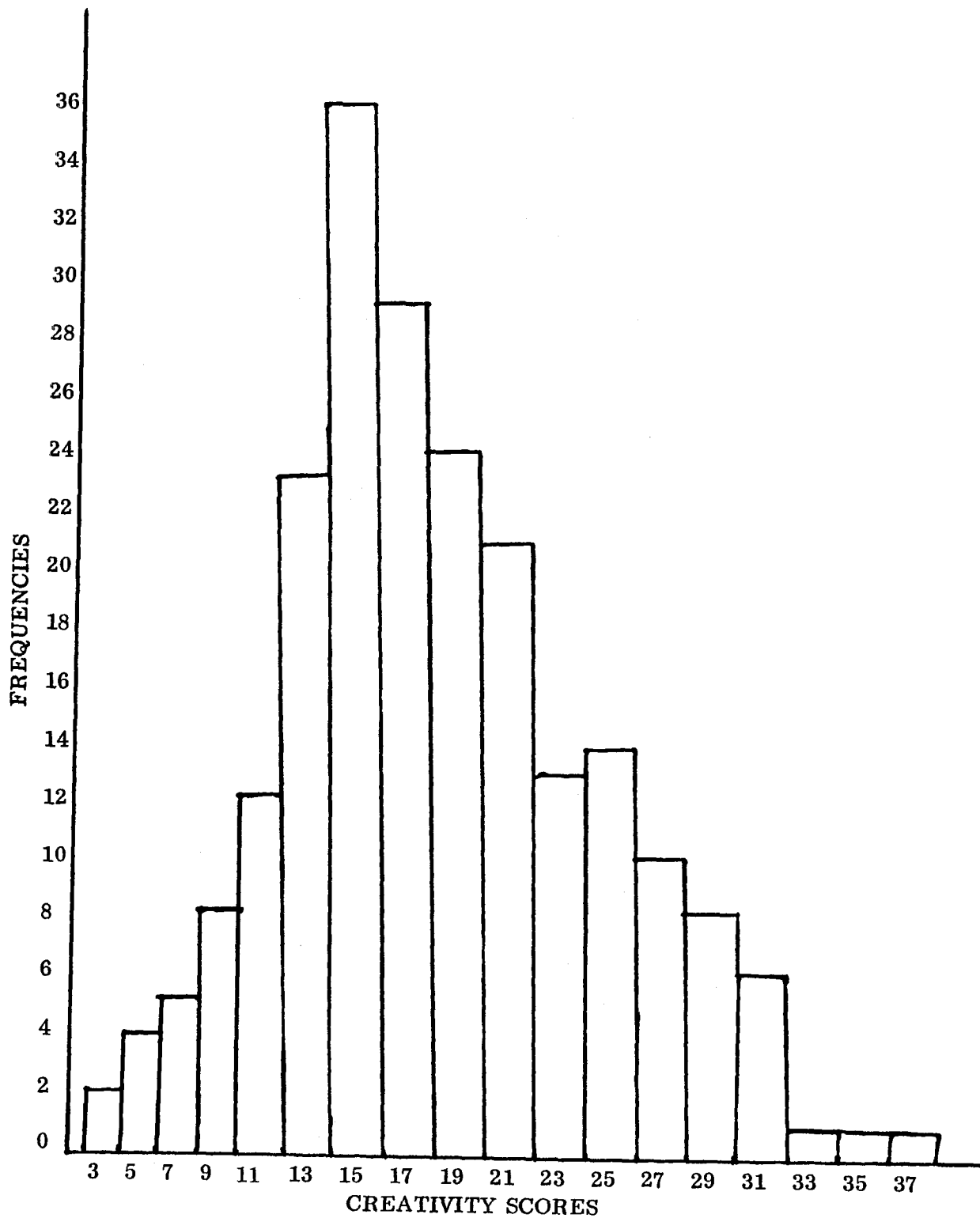


Figure 4. Histogram of Creativity Scores for Population (N = 218) 17-22 Years of Age

factors interaction'. On the basis of these results, a detailed analysis was then made of the simple main effects for group differences on each of the Cattell personality factors (Winer, 1962, p. 310). Table 4 presents the results of this analysis. Statistically significant differences were found for factors F, Q1 and Q2 at the probability level .05. At the .05 level of probability it is possible that one out of twenty analyses will vary significantly by chance. Therefore, since sixteen tests were made, one of these findings could possibly be attributed to chance and would need confirmation by subsequent research.

Table 4  
Analysis of Variance Simple Main Effects

Factor	MS	MS w. cell	F
F	26.029	4.0386	8.92*
Q1	15.558	4.0386	3.85**
Q2	36.029	4.0386	8.92*
*P .01 = 6.63			
**P .05 = 3.84			

## CHAPTER IV

### DISCUSSION

The results of the present study indicated that a group of subjects characterized by high creative ability and another group of students characterized primarily by high scholastic aptitude differ significantly with respect to personality on three out of the sixteen factors of the Cattell 16 P.F. Questionnaire. Two of the differences in the factors were significant at the .01 probability level. One of these factors (F) suggested that the group with high creative ability was more "enthusiastic, talkative i.e. surgent" than the group characterized by high scholastic aptitude which scored closer to the 'glum, silent i.e. desurgent' end of the scale. The highly creative group was significantly lower on factor Q2 showing greater 'dependency needs and imitative characteristics' than the group with high scholastic aptitude which was more 'self-sufficient and resourceful.' The difference between the groups on factor Q2 is contrary to the 'common sense' notion of the creative personality. According to this 'idea' the creative person would be expected to be more independent than the group with high scholastic aptitude.

An additional factor (Q1) differentiated the two groups at the .05 level of significance. This probability level is suggestive of significance but it requires confirmation by subsequent research. On factor Q1 the highly creative

group scored lower being more 'conservative and accepting' than the high scholastic aptitude group who were found to be more 'experimenting, critical i. e. radical." This difference is also contrary to 'common sense' expectancy which would tend to find the creative group more critical and radical than the high scholastic aptitude group. These contrary to expectancy findings will now be discussed as the results of this study are compared to related research.

#### Comparison of Results to Related Research

The results indicated that the group manifesting high creative ability in this investigation scored similarly to Cattell's productive scientist group (1963) on only four of the sixteen factors of the 16 P.F.. The comparative differences between the groups showed the creative group to be more cyclothymic and surgent and less intelligent, sensitive, experimenting and resourceful than the scientists. It is possible that the differences were a function of the type of creativity manifested in scientific productions and that measured by the Alternate Uses Test. Taylor (1959) would disagree here, emphasizing that creativity varies in depth and scope rather than type. Taylor considers it misleading, for instance, to distinguish between scientific and artistic creativity, or any kind of creativity for that matter, since creativity involves an approach to problems more basic than the accident of professional training.

Furthermore, the personality traits of the highly creative subjects were found to have a closer affinity with the non-creative subjects in Drevdahl's (1956) study and not with his creative group. Drevdahl described creative subjects as radical, self-sufficient and desurgent. The creative subjects of the

present study, on the other hand, were shown to be conservative, dependent and surgent.

A final comparison found the present creative group differing from the findings of Drevdahl and Cattell's (1958) investigation with a group of artists and writers. Emotional sensitivity, radicalism and self-sufficiency were characteristic of their creative subjects, while toughness, conservatism and dependency typify the present creative sample.

In summary, the significant results of the present investigation were found to be contradictory to the findings of previous research. Primarily, the creative group would be expected to score higher on radicalism and self-sufficiency and lower on surgency. In view of these incompatible results several things were suggested:

- 1) It is possible that the common sense notion of the personality of creative individuals is not valid.
- 2) The Cattell personality test, like any other questionnaire of its kind, is subject to intentional distortion. The individuals who participated in this experiment might have responded to the stimulus variables of the 16 P.F. in accordance with what they thought they should say and not what they actually preferred.
- 3) The creativity test used in this study is not as valid a measure of creativity as might be suggested by Guilford in a personal communication to this author.
- 4) The results might be influenced by an interaction effect of the variables involved in this study i. e. creativity and scholastic aptitude.

The above suggestions regarding possible explanations for the incompatible results found in this study will now be evaluated with respect to their

own strengths and weaknesses.

The significance of the present results in relation to previous research can only be clarified if the present study represents an improvement in the experimental design and the validity and reliability of the measurements has been achieved. The method of subjective rating used by Drevdahl and Cattell for determining creative ability has been improved upon in this study by employing a more objective measure i. e. the Guilford Alternate Uses Test.

With respect to previous research on the Cattell 16 P.F. as a measure of personality, the validity and reliability are satisfactory (experimental design, p. 24). Similar to all personality tests of this kind, however, the adequacy of the results depends on a reasonable amount of insight and truthfulness on the part of the subject in responding to the stimulus variables.

The adequacy of the Alternate Uses Test as a satisfactory measure of creativity is the third point in question when considering the value of the present study. A limitation arises by having one single test to measure the complex number of dimensions associated with creative ability. In other words, the Guilford Alternate Uses Test seems to measure only one small aspect of creativity, specifically that of "spontaneous flexibility," and this might not necessarily be a primary dimension.

MacKinnon (1961), after carrying out several years of research with creative, effective people, gives evidence that in all samples studied, the Guilford tests, scored for quantity or quality, did not correlate well with the degree of creativity as judged by experts in the subject's own fields (as cited in

Golann, 1963, p. 552). Particular information, regarding the subjects and tests employed in this unpublished study carried out by Mackinnon (1961) at the Institute of Personality Assessment and Research, Berkeley, California, was not furnished by Golann.

Both Drevdahl (1956) and MacKinnon (1961) using the Guilford measures of creativity and specifically "spontaneous flexibility" have reported non-significant results between creative and non-creative groups chosen by the ratings of experts from the subjects own field.

Garwood (1954) found a Pearson product-moment correlation of .74 significant at the probability level .01 for the Alternate Uses Test measuring "spontaneous flexibility" and a composite creativity score. This was the second highest of the total number of correlations computed using the composite score which was derived from Guilford Factors. Thus, previous research investigating the adequacy of the Alternate Uses Test as a satisfactory measure of creativity leaves more to be desired.

A final question regarding a possible interaction of creativity and scholastic aptitude effecting the performance of the subjects on the 16 P.F. remains unanswered.

Cattell (1945a) examined the associations of personality traits with abilities, specifically with verbal and mathematical abilities. The ability measurements Cattell used were the Army Alpha Intelligence Test (Verbal and Numerical sections combined in a single test total) and mathematical and verbal ability on the Graduate Record Examination. The personality data used in this

investigation consisted of carefully controlled ratings on thirty-five personality trait clusters, found to be representative of the whole personality sphere by Cattell in another study (1945b). A process of successive partialling out of known personality factors from a correlation of mathematical and verbal abilities with personality traits was then performed. From this process, the verbal and mathematical abilities were found to have in approximately equal amounts the factor B (General Ability), G (Character Integration) and K (Trained, Cultured Mind--possibly a factor of length of general education). Correlations were found with these factors at, 0.45, 0.4, and 0.3 respectively.

Partialling out, on the basis of these estimates, reduced most of the correlations of personality traits with abilities to zero. A few correlations did remain, however, and these can be summarized as follows: 1) A slight correlation of mathematical ability with personality factor F (Surgency) (0.2), H (Rhythmic Cyclothymia) (0.2) and E (Dominance) (-0.1). 2) A more appreciable correlation of verbal ability with I (Nervous Emotionality) (0.5), F (Surgency) (-0.35) and A (Cyclothymia) (-0.25).

Thus, low correlations were found by Cattell between verbal and mathematical ability and the personality factors of the Cattell 16 P. F. Questionnaire. Normally, this would imply that the results obtained on the personality test in this study would be due to group differences on the other variable involved i. e. creative ability as measured by the Alternate Uses Test. However, the possibility remains that an interaction of variables is influencing the present results and not scholastic aptitude itself or creativity itself.



The main point of concern here is that the data collected on both the subjects with high creative ability and the subjects with high scholastic aptitude is inadequate. Specifically, creativity involves more than test performance on a creativity test or being rated as creative by experts from a particular field. The limitations of the I.Q. test as an overall measure of intellectual functioning were noted by several authors in Chapter I. The measurements of creativity are susceptible to these same limitations but more so because of the newness of the measuring device. The choice of the Alternate Uses Test as a measure of creativity involves only one aspect of creative ability i. e. (spontaneous flexibility) and is not adequate. Only one form of the Cattell personality test (Form A) was used in this experiment. It is possible that by including all three forms (Forms A, B and C), thus increasing the number of items for each of the 16 personality factors of the Cattell, a more valid estimate of the personality of the subjects could be made. A motivational distortion score is furnished for Form C and this would help to determine if the response pattern of the subjects was influenced by their desire to make a good impression. Finally, a more sophisticated experimental design must be employed to control for a possible interaction effect of the variables concerned i. e. creativity and scholastic aptitude.

As future studies on creativity and the creative process develop, there are important factors arising out of the present study which this author feels should be taken into account:

- 1) Both objective and subjective measures should be combined to give a more

inclusive estimate of creative ability. In this process, a wide range of objective measures as well as other types of measures i. e. assessment of judges and ratings by several different groups of individuals should be included for a more accurate evaluation.

2) In future studies on creativity, every effort should be made to control for influences due to the interaction of partially related variables, i. e. creativity and intelligence or scholastic aptitude. An improvement over the experimental design of the present study would be to include four groups instead of two. The criterion of selection for these groups would be:

Group 1 - High Creative Ability - Low Scholastic Aptitude

Group 2 - High Creative Ability - High Scholastic Aptitude

Group 3 - High Scholastic Aptitude - Low Creative Ability

Group 4 - Low Scholastic Aptitude - Low Creative Ability

3) The need for a longitudinal study is evident in order to discover and observe abilities and traits of creative individuals as they develop in time.

4) As any study of creativity develops, attention should be paid to the personality dynamics operating in the creative individual as well as his basic abilities. By particular reference to the whole individual, we can thus obtain a more inclusive estimate of the personality of creative subjects.

## CHAPTER V

### SUMMARY AND CONCLUSIONS

#### Summary

It was hypothesized that a group of college students who obtained high scores on a test of creativity (Guilford's Alternate Uses Test) would differ significantly with respect to personality from another group of college students who scored highly on a scholastic aptitude test (S.C.A.T.).

After both preliminary tests were administered, control for age was made and the two groups were selected for further testing. One group, a high creativity group, scored in the top 20% on the test of creativity and below the top 70% on the scholastic aptitude test. The other, a group with high scholastic aptitude, was chosen for its ability to score within the top 40% on the scholastic aptitude test while scoring below the top 75% on the test of creativity.

Once the groups were formed, a personality test (Cattell Sixteen Personality Factor Questionnaire) was administered. The results of this test indicated a significant difference between the mean sten scores of the groups on Factors F and Q2 at the .01 probability level. One other factor (Q1) was found to be significant at .05 probability level. The statistical analysis employed in arriving at these values was a complex analysis of variance with a further comparison of simple main effects.

## Conclusions

On the basis of this study, the following conclusions are reached concerning the problem posed in Chapter I.

The hypothesis was supported in so far as the two groups differed significantly on three out of the sixteen factors measured by the Cattell personality test. The group characterized by high creative ability was found to be more surgent, conservative and dependent than the group characterized by high scholastic aptitude who were more desurgent, radical and self-sufficient.

Since the results of the present study vary considerably from the findings of past studies employing the Cattell 16 P.F., a question arose regarding the adequacy of the creativity test employed. The author agrees with Guilford in so far as his Alternate Uses Test probably does measure a factor labeled "spontaneous flexibility." However, this factor represents only one aspect of the complex processes involved in creativity. A question regarding the interaction effect of partially related variables also arose which might be influencing the results obtained. A more sophisticated experimental design was suggested as the best method to control for this possible influence. Thus, only by keeping these points in mind can an accurate estimation of this investigation be made. The limitations of the contribution of this study are therefore evident.

Further research is assuredly necessary regarding the dynamic personality of the creative individual. Of great significance in future studies in this area is the ability of the tests employed to be adequate enough to give a valid estimate of the intellectual functions or personality traits they are supposed to measure. A sophisticated experimental design is also important to control for

all possible variables. Finally, the whole individual with all his abilities and traits must be taken into account before a complete investigation of the creative personality can be achieved.

# APPENDIX A

Table 5

Relevant Data Regarding 16 P. F. Sten Scores for High Creativity  
and High Scholastic Aptitude Groups

High Creativity Group	A	B	C	E	F	G	H	I	L	M	N	O	Q1	Q2	Q3	Q4
FACTORS																
1	7	3	10	4	10	7	2	3	7	3	7	5	7	4	4	9
2	7	7	6	3	10	5	3	5	8	6	4	5	3	4	2	6
3	7	7	3	9	10	3	5	5	9	6	6	6	6	6	4	6
4	5	7	1	8	7	5	6	7	10	9	7	10	6	6	1	10
5	6	4	6	5	4	7	4	5	7	9	6	10	4	7	4	9
6	9	6	4	8	5	2	5	4	8	9	6	5	2	5	6	6
7	9	4	9	6	10	4	7	6	3	5	5	3	4	7	5	2
8	4	6	6	6	6	6	8	6	6	6	3	6	4	3	8	3
9	6	4	6	3	2	7	8	2	6	6	5	3	6	8	6	4
10	5	6	7	3	7	2	6	6	5	8	9	5	6	7	3	6
11	3	6	6	6	7	5	4	1	5	4	7	7	8	4	6	8
12	6	8	7	6	7	5	6	4	5	5	6	5	5	5	5	7
13	3	4	7	5	6	2	5	5	7	6	4	7	2	3	6	8
14	6	5	2	10	10	2	9	8	8	8	8	8	6	7	8	6
15	6	6	9	5	7	5	7	3	4	4	5	4	2	7	2	5
16	6	6	5	8	6	4	2	5	8	9	7	5	5	4	3	8
17	5	4	6	4	7	4	5	4	6	8	6	5	4	3	4	6
High Scholastic Aptitude Group	A	B	C	E	F	G	H	I	L	M	N	O	Q1	Q2	Q3	Q4
1	3	4	8	6	4	1	6	8	9	9	8	7	10	10	4	8
2	6	6	4	6	8	7	6	2	7	6	7	5	8	7	6	2
3	3	4	5	6	7	5	6	6	5	5	8	8	3	2	8	8
4	1	8	4	6	5	7	6	5	6	9	3	6	6	8	5	9
5	8	6	5	5	7	7	4	10	6	5	10	9	7	8	5	6
6	6	6	6	8	6	4	6	9	8	8	8	4	7	9	4	5
7	7	9	6	5	5	2	6	5	9	8	4	5	8	7	3	8
8	3	9	5	4	3	6	6	8	6	6	4	5	5	7	7	5
9	3	8	1	4	3	7	2	3	9	8	3	8	7	10	4	10
10	7	6	7	5	6	5	10	2	1	3	4	4	7	7	7	2
11	7	5	6	6	7	8	4	5	1	5	6	6	4	5	7	5
12	5	9	2	1	5	7	2	8	8	5	1	10	2	8	2	9
13	8	4	4	2	1	4	4	3	5	4	5	7	7	10	6	6
14	2	6	4	2	6	4	5	7	5	4	7	3	5	6	8	5
15	5	6	5	5	3	3	2	5	8	9	4	7	4	7	5	8
16	8	6	8	4	7	7	6	4	6	5	9	5	7	5	6	5
17	5	8	4	4	3	4	6	7	4	8	4	4	6	9	3	5

**APPENDIX B**

**I.P.A.T. CATTELL SIXTEEN PERSONALITY FACTOR  
QUESTIONNAIRE FORM A**

**WHAT TO DO:** Inside this booklet are some questions to see what attitudes and interests you have. There are no "right" and "wrong" answers because everyone has the right to his own views. To be able to get the best advice from your results, you will want to answer them exactly and truly.

If a separate "Answer Sheet" has not been given to you, turn this booklet over and tear off the Answer Sheet on the back page.

Write your name and other particulars at the top of the Answer Sheet.

First, you should answer the four sample questions below so that you can see whether you need to ask anything before starting. Although you are to read the questions in this booklet, you must record your answers on the answer sheet (alongside the same number as in the booklet).

There are three possible answers to each question. Read the following examples and mark your answers at the top of your answer sheet where it says "Examples". Put a mark, x, in the left-hand box if your answer choice is the "a" answer, in the middle box if your answer choice is the "b" answer, and in the right-hand box if you choose the "c" answer.

#### EXAMPLES:

1. I like to watch team games. (a) yes, (b) occasionally, (c) no.
2. I prefer people who:  
(a) are reserved, (b) (are) in between, (c) make friends quickly.
3. Money cannot bring happiness. (a) yes (true), (b) in between, (c) no (false).
4. Woman is to child as cat is to: (a) kitten, (b) dog, (c) boy.

In the last example there is a right answer—kitten. But there are very few such reasoning items among the questions.

Ask *now* if anything is not clear. The examiner will tell you in a moment to turn the page and start.

When you answer, keep these four points in mind:

1. You are asked not to spend time pondering. **Give the first, natural answer as it comes to you.** Of course, the questions are too short to give you all the particulars you would sometimes like to have. For instance, the above question asks you about "team games" and you might be fonder of football than basketball. But you are to reply "for the average game", or to strike an average in situations of the kind stated. Give the best answer you can at a rate not slower than five or six a minute. You should finish in a little more than half an hour.
2. Try **not** to fall back on the middle, "uncertain" answers except when the answer at either end is really **impossible** for you—perhaps once every two or three questions.
3. Be sure not to skip anything, **but answer every question, somehow.** Some may not apply to you very well, but give your best guess. Some may seem personal; but remember that the answer sheets are kept confidential and cannot be scored without a special stencil key. Answers to particular questions are not inspected.
4. Answer as honestly as possible what is true of **you**. Do not merely mark what seems "the right thing to say" to impress the examiner.

**DO NOT TURN PAGE UNTIL TOLD TO DO SO**





1. I have the instructions for this test clearly in mind. (a) **yes**, (b) **uncertain**, (c) **no**.
2. I am ready to answer each question as truthfully as possible. (a) **yes**, (b) **uncertain**, (c) **no**.
3. It would be good for everyone if vacations (holidays) were longer and everyone *had* to take them. (a) **agree**, (b) **uncertain**, (c) **disagree**.
4. I can find enough energy to face my difficulties. (a) **always**, (b) **generally**, (c) **seldom**.
5. I feel a bit nervous of wild animals even when they are in strong cages. (a) **yes**, (b) **in between**, (c) **no**.
6. I believe it is right to understate how good I am at something, when people ask. (a) **yes**, (b) **in between**, (c) **no**.
7. I make smart, sarcastic remarks to people if I think they deserve it. (a) **generally**, (b) **sometimes**, (c) **never**.
8. I get on better with people who: (a) **keep an open mind and refuse to come to an early conclusion**, (b) **are in between (a) and (c)**, (c) **know exactly what their own opinions are**.
9. If I saw two neighbors' children fighting I would: (a) **leave them to settle it**, (b) **uncertain**, (c) **reason with them**.
10. On social occasions I: (a) **readily come forward and speak**, (b) **respond in between**, (c) **prefer to stay quietly in the background**.
11. I would rather be: (a) **a construction engineer**, (b) **uncertain**, (c) **a teacher of social studies**.
12. I would rather spend a free evening: (a) **with a good book**, (b) **uncertain**, (c) **working on a hobby with friends**.
13. I can generally put up with conceited people, even though they brag or show they think too well of themselves. (a) **yes**, (b) **in between**, (c) **no**.
14. I prefer to marry someone who: (a) **commands general admiration**, (b) **in between**, (c) **has artistic and literary gifts**.
15. I sometimes get an unreasonable dislike for a person: (a) **but it is so slight I hide it easily**, (b) **in between**, (c) **which is so definite that I tend to express it**.
16. I think it is more important: (a) **to teach all people an international language**, (b) **uncertain**, (c) **to abolish the laws which prevent a person's managing his sex life according to his own good judgment**.
17. I am always keenly aware of attempts at propaganda in things I read. (a) **yes**, (b) **uncertain**, (c) **no**.
18. I wake up in the night and, through worry, have difficulty in sleeping again. (a) **often**, (b) **sometimes**, (c) **never**.
19. I feel sure that I could "pull myself together" to deal with an emergency. (a) **always**, (b) **generally**, (c) **seldom**.
20. I think the spread of birth control is essential to solving the world's economic and peace problems. (a) **yes**, (b) **uncertain**, (c) **no**.
21. Many troubles arise today through lack of: (a) **moral and religious idealism**, (b) **uncertain**, (c) **scientific education and thinking**.
22. In constructing something I would rather work: (a) **with a committee**, (b) **uncertain**, (c) **on my own, perhaps with one or two assistants**.
23. Through getting tense I use up more energy than most people in getting things done. (a) **constantly**, (b) **occasionally**, (c) **never**.
24. In my job I appreciate constant change in the type of work to be done. (a) **yes**, (b) **in between**, (c) **no**.
25. I feel an urge to "doodle", make little designs on the corner of the paper, and busy my fingers in some way, when kept sitting still at a meeting. (a) **never**, (b) **occasionally**, (c) **often**.

(End of first column on answer sheet.)

26. With the same work hours and pay, I would prefer the life of: (a) a house carpenter or cook, (b) uncertain, (c) a waiter in a good restaurant.
27. I would prefer to work in a business: (a) keeping accounts and records, (b) in between, (c) talking to customers.
28. "Spade" is to "dig" as "knife" is to: (a) sharp, (b) cut, (c) shovel.
29. I think it best to avoid very exciting, fatiguing events. (a) yes, (b) in between, (c) no.
30. I would rather listen to: (a) a brass band, (b) uncertain, (c) a good choir, as in a church.
31. I doubt my ability to do ordinary things as well as other people. (a) generally, (b) often, (c) occasionally.
32. I tend to feel nervous and harried in the presence of business superiors. (a) yes, (b) in between, (c) no.
33. I sometimes make rash remarks in fun, just to surprise people and see what they will say. (a) yes, (b) in between, (c) no.
34. I am an easygoing person, not insisting on always doing things as exactly as possible. (a) true, (b) in between, (c) false.
35. I get slightly embarrassed if I suddenly become the focus of attention in a social group. (a) yes, (b) in between, (c) no.
36. I am always glad to join a large gathering, for example, a party, dance, or public meeting. (a) yes, (b) in between, (c) no.
37. In school I preferred: (a) music, (b) uncertain, (c) handwork and crafts.
38. I believe most people are a little "queer" mentally, though they do not like to admit it. (a) yes, (b) in between, (c) no.
39. I like a friend (of my sex) who: (a) seriously thinks out his attitudes to life, (b) in between, (c) is efficient and practical in his interests.
40. My deeper moods sometimes make me seem unreasonable, even to myself. (a) yes, (b) in between, (c) no.
41. I think people should make more of their decisions on: (a) what their natural feelings tell them is right, (b) in between, (c) cold realism and intelligent logic.
42. Young people get rebellious, impractical ideas, but as they grow up they should get over them and settle down. (a) yes, (b) in between, (c) no.
43. I am inclined to worry when there is no sufficient reason for doing so. (a) yes, (b) in between, (c) no.
44. I feel grouchy and just do not want to see people: (a) occasionally, (b) sometimes, (c) rather often.
45. I feel a strong need for someone to lean on in times of sadness. (a) yes, (b) in between, (c) no.
46. When I was about fourteen and fifteen, if I had a difference of opinion with my parents I usually: (a) kept my own opinion, (b) in between, (c) accepted to some extent my parents' opinion.
47. When I was about fourteen and fifteen, I joined in school sports: (a) occasionally, (b) fairly often, (c) a great deal.
48. I would rather stop in the street to watch an artist painting than to listen to some people having an argument. (a) yes, (b) uncertain, (c) no.
49. I sometimes get in a state of tension and turmoil as I think of the day's happenings. (a) yes, (b) in between, (c) no.
50. I sometimes doubt whether people I am talking to are really interested in what I am saying. (a) yes, (b) in between, (c) no.

(End of second column on answer sheet.)

51. I would prefer to be: (a) a forester, (b) uncertain, (c) a grammar or high school teacher.
52. I enjoy music that is: (a) light, dry, and brisk, (b) in between, (c) emotional and sentimental.
53. "Tired" is to "work" as "proud" is to: (a) rest, (b) success, (c) exercise.
54. Which of the following items is different in kind from the others? (a) candle, (b) moon, (c) electric light.
55. I admire my parents in all important matters. (a) yes, (b) uncertain, (c) no.
56. I have some characteristics in which I feel superior to most people. (a) yes, (b) uncertain, (c) no.
57. I have no objection to a job that involves my looking soiled and messy all day. (a) yes, (b) in between, (c) no.
58. I tend toward: (a) a rather reckless optimism, (b) in between, (c) an overcautious pessimism.
59. I think that plenty of freedom is more important than good manners and respect for law. (a) yes, (b) in between, (c) no.
60. I tend to keep quiet in the presence of senior persons (people of greater experience, age, or rank). (a) yes, (b) in between, (c) no.
61. I find it hard to address, or recite to, a large group. (a) yes, (b) in between, (c) no.
62. My friends consider me a highly practical, realistic person. (a) yes, (b) in between, (c) no.
63. If I make an awkward social mistake I can soon forget it. (a) yes, (b) in between, (c) no.
64. I can compete strongly with a rival without much feeling of jealousy or hostility. (a) yes, (b) in between, (c) no.
65. My memory tends to drop a lot of unimportant, trivial things, for example, names of streets or shops in town. (a) yes, (b) in between, (c) no.
66. I would enjoy better: (a) trying to puzzle out a problem story on my own, (b) uncertain, (c) playing a game needing tactical skill of hand and eye.
67. I would prefer to be shown over: (a) a prison for hardened criminals, (b) uncertain, (c) a model town sewage disposal plant.
68. I feel well-adjusted to life and its demands. (a) always, (b) sometimes, (c) hardly ever.
69. People sometimes tell me that I show my excitement in voice and manner too obviously. (a) yes, (b) in between, (c) no.
70. I sometimes find it impossible to get done all that has to be done in the day without getting hurried and cross. (a) yes, (b) in between, (c) no.
71. I prefer to marry someone who can: (a) keep the family interested in its own activities, (b) in between (c) make the family part of the social life of the neighborhood.
72. One can hardly do a thing these days without being regulated or exploited by "big business" or government agencies. (a) yes, (b) in between, (c) no.
73. I can work on most things without being bothered by people making a lot of noise around me. (a) yes, (b) in between, (c) no.
74. I feel that on one or two occasions recently I have been blamed more than I really deserve. (a) yes, (b) in between, (c) no.
75. At times of stress or overwork I suffer from indigestion or constipation: (a) never, (b) just occasionally, (c) sometimes.

(End of third column on answer sheet.)

76. In starting a useful invention I would prefer: (a) **working on it in the laboratory**, (b) **uncertain**, (c) **selling it to people**.
77. "Surprise" is to "strange" as "fear" is to: (a) **brave**, (b) **anxious**, (c) **terrible**.
78. Which of the following fractions is not in the same class as the others? (a)  $\frac{3}{7}$ , (b)  $\frac{3}{9}$ , (c)  $\frac{3}{11}$ .
79. I would enjoy being a newspaper writer on drama, concerts, opera, etc. (a) **yes**, (b) **uncertain**, (c) **no**.
80. I feel that people are not as considerate to me as my good intentions deserve. (a) **often**, (b) **occasionally**, (c) **never**.
81. The use of foul language, even if not in a mixed group of men and women, still disgusts me. (a) **yes**, (b) **in between**, (c) **no**.
82. I have decidedly fewer friends than most people. (a) **yes**, (b) **in between**, (c) **no**.
83. If people on a team (or anything else) I am managing will just follow ordinary instructions, I will guarantee its performance. (a) **yes**, (b) **in between**, (c) **no**.
84. People sometimes call me careless, even though they think me a fine person. (a) **yes**, (b) **in between**, (c) **no**.
85. My reserve always stands in the way when I want to speak to an attractive stranger of the opposite sex. (a) **yes**, (b) **in between**, (c) **no**.
86. I would rather have a job with: (a) **a fixed, certain salary**, (b) **in between**, (c) **a larger salary, but depending on my constantly persuading people I am worth it**.
87. I prefer reading: (a) **a realistic account of military or political battles**, (b) **uncertain**, (c) **a sensitive, imaginative novel**.
88. When bossy people try to "push me around," I do just the opposite of what they want. (a) **yes**, (b) **in between**, (c) **no**.
89. A person who hurts and damages a close friend or relative can still be reasonably regarded as a decent, normal being. (a) **yes**, (b) **in between**, (c) **no**.
90. I like continually to have to learn to work new gadgets in everyday things, from can openers to cars. (a) **yes**, (b) **uncertain**, (c) **no**.
91. One should be careful about mixing with all kinds of strangers, for there are dangers of infection and other things. (a) **yes**, (b) **uncertain**, (c) **no**.
92. I would like to see a move toward: (a) **eating more vegetable foods, to avoid killing so many animals**, (b) **neither**, (c) **operations to stop people having children who would be idiots**.
93. If acquaintances treat me badly and show they dislike me: (a) **it does not upset me a bit**, (b) **in between**, (c) **I tend to get downhearted**.
94. Those who think "the best things in life are free" are usually the ones who own nothing but what is free. (a) **yes**, (b) **in between**, (c) **no**.
95. It would be better if we had more strict observance of Sunday, as a day to go to church. (a) **yes**, (b) **in between**, (c) **no**.
96. When I was about seventeen or eighteen I went out with the opposite sex: (a) **a lot**, (b) **as much as most people**, (c) **very little**.
97. I like to take an active part in social affairs, committee work, etc. (a) **yes**, (b) **in between**, (c) **no**.
98. The idea that sickness comes as much from mental as physical causes is much exaggerated. (a) **yes**, (b) **in between**, (c) **no**.
99. Quite small setbacks occasionally irritate me too much. (a) **yes**, (b) **in between**, (c) **no**.
100. When annoyed I may blurt out remarks that hurt people's feelings: (a) **never**, (b) **rarely**, (c) **sometimes**.

(End of fourth column on answer sheet.)

101. When traveling I like to spend spare time: (a) talking to people about their work, interests, etc., (b) in between, (c) enjoying the scenery.
102. "Size" is to "length" as "dishonesty" is to: (a) prison, (b) sin, (c) stealing.
103. AB is to dc as SR is to: (a) qp, (b) pq, (c) tu.
104. When people are unreasonable I just: (a) keep quiet, (b) in between, (c) despise them.
105. I can always change old habits without difficulty and without relapse. (a) yes, (b) in between, (c) no.
106. I think I am better described as: (a) polite and quiet, (b) in between, (c) lively and active.
107. I feel some of my gifts have never been expressed enough for people to recognize them. (a) yes, (b) in between, (c) no.
108. I like to go out to a show or entertainment: (a) less than once a week (less than average), (b) about once a week (average), (c) more than once a week (more than average).
109. I make sure that anyone who hurts my good name regrets it in the long run. (a) generally, (b) sometimes, (c) not usually.
110. I have at least as many friends of the opposite sex as of my own sex. (a) yes, (b) in between, (c) no.
111. Even in an important game, I am more concerned to enjoy it than to win it. (a) always, (b) generally, (c) occasionally.
112. I would rather be: (a) a guidance worker with young people seeking careers, (b) uncertain, (c) a manager in a technical manufacturing concern.
113. If I am quite sure that a person is unjust or behaving selfishly, I show him up, even if it takes some trouble. (a) yes, (b) in between, (c) no.
114. Most people resent putting themselves out for others, no matter how politely they deny it. (a) yes, (b) in between, (c) no.
115. My artistic feelings sometimes outweigh common sense. For example, I would not live in a wrongly-decorated apartment even if it saved money. (a) true, (b) uncertain, (c) false.
116. I like to: (a) be free of personal entanglements, (b) in between, (c) have a circle of warm friendships, even if they are demanding.
117. I think it is more important in the modern world to solve: (a) the political difficulties, (b) uncertain, (c) the question of moral purpose.
118. I occasionally have a sense of vague danger or sudden dread for no sufficient reason. (a) yes, (b) in between, (c) no.
119. As a child I feared the dark. (a) often, (b) sometimes, (c) never.
120. On a free evening I would prefer to: (a) see an historical film about our country's past, (b) uncertain, (c) read a science fiction novel, or essay on "Science and Society".
121. It bothers me if people think I am being too unconventional or odd. (a) a good deal, (b) somewhat, (c) not at all.
122. Most people would be happier if they lived more with their fellows and did the same things as others. (a) yes, (b) in between, (c) no.
123. When talking I like: (a) to say things just as they occur to me, (b) in between, (c) to wait and say them in the most exact way possible.
124. Often I get angry with people too quickly. (a) yes, (b) in between, (c) no.
125. If something badly upsets me, I generally calm down again quite quickly. (a) yes, (b) in between, (c) no.

(End of fifth column on answer sheet.)

126. If the earnings are the same I would rather be: (a) a lawyer, (b) uncertain, (c) a freight air pilot.
127. "Better" is to "worst" as "slower" is to: (a) fast, (b) best, (c) quickest.
128. Which of the following should come next at the end of this row of letters: xooooxxooooxx? (a) xox, (b) oox, (c) oxx.
129. When I have planned and looked forward to something, I sometimes do not feel well enough to go. (a) true, (b) in between, (c) false.
130. I could enjoy the life of an animal doctor, handling diseases and surgery of animals. (a) yes, (b) in between, (c) no.
131. I occasionally tell strangers about the things I am interested in and good at, without direct questions from them. (a) yes, (b) in between, (c) no.
132. I spend much of my spare time talking with friends over social events enjoyed in the past. (a) yes, (b) in between, (c) no.
133. I enjoy doing "daring", foolhardy things "just for fun". (a) yes, (b) in between, (c) no.
134. I think the police can be trusted not to ill-treat innocent people. (a) yes, (b) in between, (c) no.
135. I consider myself a very sociable, talkative person. (a) yes, (b) in between, (c) no.
136. In social contacts I: (a) express my emotions very readily, (b) in between, (c) keep my emotions to myself.
137. I would rather spend an afternoon in: (a) a game of cards, (b) uncertain, (c) working on a project with friends.
138. I try to make my laughter at jokes quieter than most people's. (a) yes, (b) in between, (c) no.
139. When people jostle me about in a crowd I (a) never mind it, (b) sometimes dislike it, (c) get irritated.
140. The teaching of different beliefs about right and wrong is (a) always interesting, (b) something we cannot avoid, (c) unpleasant and wasteful.
141. I am always interested in mechanical matters—for example, in cars and airplanes. (a) yes, (b) in between, (c) no.
142. I like to tackle problems that other people have made a mess of. (a) yes, (b) in between, (c) no.
143. I am properly regarded as only a plodding half-successful person. (a) true, (b) uncertain, (c) false.
144. If people take advantage of my friendliness I: (a) deeply resent it and act accordingly, (b) in between, (c) soon forget and forgive.
145. I am considered a thoughtful person, depending a lot on my own ideas. (a) yes, (b) in between, (c) no.
146. I like to do my planning alone, without interruptions and suggestions from others. (a) yes, (b) in between, (c) no.
147. I sometimes let my actions get swayed by feelings of jealousy. (a) yes, (b) in between, (c) no.
148. I know I do most things at least a *bit* more thoroughly than most people. (a) yes, (b) in between, (c) no.
149. I tend to tremble or perspire when I think of a difficult task ahead. (a) generally, (b) occasionally, (c) never.
150. In the past year I have: (a) found life "plain sailing", (b) had just average troubles, (c) had a bit more than my share of trouble.

(End of sixth column on answer sheet.)



151. I would prefer the life of: (a) **an artist**, (b) **uncertain**, (c) **a secretary running a social club**.
152. Which of the following words does not properly belong with the others? (a) **any**, (b) **some**, (c) **most**.
153. "Flame" is to "heat" as "rose" is to: (a) **thorn**, (b) **red petals**, (c) **scent**.
154. I have vivid dreams, disturbing my sleep. (a) **often**, (b) **occasionally**, (c) **practically never**.
155. If the odds are really against something's being a success, I still believe in taking the risk. (a) **yes**, (b) **in between**, (c) **no**.
156. I like it when I know so well what the group has to do that I naturally become the one in command. (a) **yes**, (b) **in between**, (c) **no**.
157. I prefer to dress: (a) **very quietly and correctly**, (b) **in an average way**, (c) **with a bit of definite style that people can see**.
158. I enjoy more an evening: (a) **with a good hobby of my own**, (b) **uncertain**, (c) **in a lively party**.
159. In thinking of difficulties in my work, I (a) **assume I can handle them when they come**, (b) **in between**, (c) **try to plan ahead, before I meet them**.
160. I always make a point, in deciding anything, to refer to basic principles of right conduct. (a) **yes**, (b) **in between**, (c) **no**.
161. I somewhat dislike having a group watching me at work. (a) **yes**, (b) **in between**, (c) **no**.
162. I keep my room well organized, with things in known places almost all the time. (a) **yes**, (b) **in between**, (c) **no**.
163. In school I preferred: (a) **English**, (b) **uncertain**, (c) **mathematics or arithmetic**.
164. I have sometimes been troubled by people saying bad things about me, behind my back, with no grounds at all. (a) **yes**, (b) **in between**, (c) **no**.
165. Talk with ordinary, habit-bound, conventional people: (a) **is often quite interesting**, (b) **in between**, (c) **annoys me because it is superficial and insensitive**.
166. I find it embarrassing to have praise or compliments bestowed on me. (a) **yes**, (b) **in between**, (c) **no**.
167. I think it is wiser to keep the nation's military forces strong than to seek international agreements. (a) **yes**, (b) **in between**, (c) **no**.
168. People regard me as a kind of solid, unperturbable person they can leave in charge of things. (a) **yes**, (b) **in between**, (c) **no**.
169. I think society should be quicker to adopt new customs and throw aside old habits and mere traditions. (a) **yes**, (b) **in between**, (c) **no**.
170. My viewpoints change in an uncertain way because I trust my feelings more than logical reasoning. (a) **yes**, (b) **to some extent**, (c) **no**.
171. I learn better by: (a) **reading a well-written book**, (b) **in between**, (c) **joining a group discussion**.
172. I have periods when I cannot stop a mood of self pity. (a) **often**, (b) **occasionally**, (c) **never**.
173. I like to wait till I am sure that what I am saying is correct, before I put forward an argument. (a) **always**, (b) **generally**, (c) **only if it's practicable**.
174. Small things sometimes "get on my nerves" unbearably though I realize them to be trivial. (a) **yes**, (b) **in between**, (c) **no**.
175. In physical and mental work I seem to need rest: (a) **only when everyone else is exhausted**, (b) **about like most people**, (c) **before many people, if I am to do my best**.

(End of seventh column on answer sheet.)



176. I prefer marrying someone who is: (a) **effective in a social group**, (b) **in between**, (c) **a thoughtful companion**.
177. Which of the following words does not belong with the other two? (a) **wide**, (b) **zigzag**, (c) **regular**.
178. "Soon" is to "never" as "near" is to: (a) **nowhere**, (b) **far**, (c) **next**.
179. I go to sleep just as easily when I drink coffee or tea (or coca cola) before bed as when I do not. (a) **yes**, (b) **in between**, (c) **no**.
180. I have sometimes been described as a rather headstrong person, following my own ideas regardless of the opinions of others. (a) **yes**, (b) **in between**, (c) **no**.
181. I think I am better at showing: (a) **courage in meeting challenges**, (b) **uncertain**, (c) **tolerance of other's views**.
182. I am generally considered a lively, enthusiastic person. (a) **yes**, (b) **in between**, (c) **no**.
183. I like a job that offers change, variety, and travel, even if it involves some danger. (a) **yes**, (b) **in between**, (c) **no**.
184. Everyone could make a success of his life with reasonable effort and perseverance. (a) **yes**, (b) **in between**, (c) **no**.
185. I enjoy work that requires careful, exacting, hand skills. (a) **yes**, (b) **in between**, (c) **no**.
186. I don't believe in persuading friends to go out if they just want to sit around at home. (a) **true**, (b) **in between**, (c) **false**.
187. I am sure there are no questions that I have skipped or failed to answer properly. (a) **yes**, (b) **uncertain**, (c) **no**.

NAME \_\_\_\_\_ SEX \_\_\_\_\_ AGE \_\_\_\_\_ DATE \_\_\_\_\_  
(Write M or F) (Nearest Year)

First

Middle

Last

EXAMPLES:

1 ☐ a2 ☐ b3 ☐ c4 ☐ d5 ☐ e6 ☐ f7 ☐ g8 ☐ h9 ☐ i10 ☐ j11 ☐ k12 ☐ l13 ☐ m14 ☐ n15 ☐ o16 ☐ p17 ☐ q18 ☐ r19 ☐ s20 ☐ t21 ☐ u22 ☐ v23 ☐ w24 ☐ x25 ☐ y26 ☐ z27 ☐ aa28 ☐ ab29 ☐ ac30 ☐ ad31 ☐ ae32 ☐ af33 ☐ ag34 ☐ ah35 ☐ ai36 ☐ aj37 ☐ ak38 ☐ al39 ☐ am40 ☐ an41 ☐ ao42 ☐ ap43 ☐ aq44 ☐ ar45 ☐ as46 ☐ at47 ☐ au48 ☐ av49 ☐ aw50 ☐ ax51 ☐ ay52 ☐ az53 ☐ ba54 ☐ bb55 ☐ bc56 ☐ bd57 ☐ be58 ☐ bf59 ☐ bg60 ☐ bh61 ☐ bi62 ☐ bj63 ☐ bk64 ☐ bl65 ☐ bm66 ☐ bn67 ☐ bo68 ☐ bp69 ☐ bq70 ☐ br71 ☐ bs72 ☐ bt73 ☐ bu74 ☐ bv75 ☐ bw76 ☐ bx77 ☐ by78 ☐ bz79 ☐ ca80 ☐ cb81 ☐ cc82 ☐ cd83 ☐ ce84 ☐ cf85 ☐ cg86 ☐ ch87 ☐ ci88 ☐ cj89 ☐ ck90 ☐ cl91 ☐ cm92 ☐ cn93 ☐ co94 ☐ cp95 ☐ cq96 ☐ cr97 ☐ cs98 ☐ ct99 ☐ cu100 ☐ cv101 ☐ cw102 ☐ cx103 ☐ cy104 ☐ cz105 ☐ da106 ☐ db107 ☐ dc108 ☐ dd109 ☐ de110 ☐ df111 ☐ dg112 ☐ dh113 ☐ di114 ☐ dj115 ☐ dk116 ☐ dl117 ☐ dm118 ☐ dn119 ☐ do120 ☐ dp121 ☐ dq122 ☐ dr123 ☐ ds124 ☐ dt125 ☐ du126 ☐ dv127 ☐ dw128 ☐ dx129 ☐ dy130 ☐ dz131 ☐ ea132 ☐ eb133 ☐ ec134 ☐ ed135 ☐ ee136 ☐ ef137 ☐ eg138 ☐ eh139 ☐ ei140 ☐ ej141 ☐ ek142 ☐ el143 ☐ em144 ☐ en145 ☐ eo146 ☐ ep147 ☐ eq148 ☐ er149 ☐ es150 ☐ et151 ☐ eu152 ☐ ev153 ☐ ew154 ☐ ex155 ☐ ey156 ☐ ez157 ☐ fa158 ☐ fb159 ☐ fc160 ☐ fd161 ☐ fe162 ☐ ff163 ☐ fg164 ☐ fh165 ☐ fi166 ☐ fj167 ☐ fk168 ☐ fl169 ☐ fm170 ☐ fn171 ☐ fo172 ☐ fp173 ☐ fq174 ☐ fr175 ☐ fs176 ☐ ft177 ☐ fu178 ☐ fv179 ☐ fw180 ☐ fx181 ☐ fy182 ☐ fz183 ☐ ga184 ☐ gb185 ☐ gc186 ☐ gd187 ☐ ge188 ☐ gf189 ☐ gg190 ☐ gh191 ☐ gi192 ☐ gj193 ☐ gk194 ☐ gl195 ☐ gm196 ☐ gn197 ☐ go198 ☐ gp199 ☐ gq200 ☐ gr201 ☐ gs202 ☐ gt203 ☐ gu204 ☐ gv205 ☐ gw206 ☐ gx207 ☐ gy208 ☐ gz209 ☐ ha210 ☐ hb211 ☐ hc212 ☐ hd213 ☐ he214 ☐ hf215 ☐ hg216 ☐ hh217 ☐ hi218 ☐ hj219 ☐ hk220 ☐ hl221 ☐ hm222 ☐ hn223 ☐ ho224 ☐ hp225 ☐ hq226 ☐ hr227 ☐ hs228 ☐ ht229 ☐ hu230 ☐ hv231 ☐ hw232 ☐ hx233 ☐ hy234 ☐ hz235 ☐ ia236 ☐ ib237 ☐ ic238 ☐ id239 ☐ ie240 ☐ if241 ☐ ig242 ☐ ih243 ☐ ii244 ☐ ij245 ☐ ik246 ☐ il247 ☐ im248 ☐ in249 ☐ io250 ☐ ip251 ☐ iq252 ☐ ir253 ☐ is254 ☐ it255 ☐ iu256 ☐ iv257 ☐ iw258 ☐ ix259 ☐ iy260 ☐ iz261 ☐ ja262 ☐ jb263 ☐ jc264 ☐ jd265 ☐ je266 ☐ jf267 ☐ jg268 ☐ jh269 ☐ ji270 ☐ jj271 ☐ jk272 ☐ jl273 ☐ jm274 ☐ jn275 ☐ jo276 ☐ jp277 ☐ jq278 ☐ jr279 ☐ js280 ☐ jt281 ☐ ju282 ☐ jv283 ☐ jw284 ☐ jx285 ☐ jy286 ☐ jz287 ☐ ka288 ☐ kb289 ☐ kc290 ☐ kd291 ☐ ke292 ☐ kf293 ☐ kg294 ☐ kh295 ☐ ki296 ☐ kj297 ☐ kk298 ☐ kl299 ☐ km300 ☐ kn301 ☐ ko302 ☐ kp303 ☐ kq304 ☐ kr305 ☐ ks306 ☐ kt307 ☐ ku308 ☐ kv309 ☐ kw310 ☐ kx311 ☐ ky312 ☐ kz313 ☐ la314 ☐ lb315 ☐ lc316 ☐ ld317 ☐ le318 ☐ lf319 ☐ lg

# IPAT

## 16 P.F. TEST PROFILE

FACTOR	Raw Score			Standard Score	LOW SCORE DESCRIPTION	STANDARD TEN SCORE (STEN) [use dots]										HIGH SCORE DESCRIPTION
	Form A	Form B	Total			Average										
						1	2	3	4	5	6	7	8	9	10	
A					Aloof, Cold (Schizothymia)	+	+	+	+			+	+	+	+	Warm, Sociable (Cyclothymia)
B					Dull, Low Capacity (Low "g")	+	+	+	+	+		+	+	+	+	Bright, Intelligent (High "g")
C					Emotional, Unstable (Low Ego Strength)	+	+	+	+	+		+	+	+	+	Mature, Calm (High Ego Strength)
E					Submissive, Mild (Submissiveness)	+	+	+	+	+		+	+	+	+	Dominant, Aggressive (Dominance)
F					Glum, Silent (Desurgency)	+	+	+	+	+		+	+	+	+	Enthusiastic, Talkative (Surgency)
G					Casual, Undependable (Low Super Ego Strength)	+	+	+	+	+		+	+	+	+	Conscientious, Persistent (High Super Ego Strength)
H					Timid, Shy (Threctia)	+	+	+	+	+		+	+	+	+	Adventurous, "Thick Skinned" (Parmia)
I					Tough, Realistic (Harria)	+	+	+	+	+		+	+	+	+	Sensitive, Effeminate (Premsia)
L					Trustful, Adaptable (Inner Relaxation)	+	+	+	+	+		+	+	+	+	Suspecting, Jealous (Protension)
M					Conventional, Practical (Praxernia)	+	+	+	+	+		+	+	+	+	Bohemian, Unconcerned (Alaxia)
N					Simple, Awkward (Naiveté)	+	+	+	+	+		+	+	+	+	Sophisticated, Polished (Shrewdness)
O					Confident, Unshakable (Confidence)	+	+	+	+	+		+	+	+	+	Insecure, Anxious (Timidity)
Q <sub>1</sub>					Conservative, Accepting (Conservatism)	+	+	+	+	+		+	+	+	+	Experimenting, Critical (Radicalism)
Q <sub>2</sub>					Dependent, Imitative (Group Dependence)	+	+	+	+	+		+	+	+	+	Self-Sufficient, Resourceful (Self-Sufficiency)
Q <sub>3</sub>					Lax, Unsure (Low Integration)	+	+	+	+	+		+	+	+	+	Controlled, Exact (Self Sentiment Control)
Q <sub>4</sub>					Phlegmatic, Composed (Low Ergic Tension)	+	+	+	+	+		+	+	+	+	Tense, Excitable (High Ergic Tension)
						1	2	3	4	5	6	7	8	9		

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STANDARD NINE SCORE (STANINE) [use crosses]

Name: \_\_\_\_\_

Psychologist's Comments: \_\_\_\_\_

## **APPENDIX C**

### **GUILFORD'S ALTERNATE USES TEST FORM A**

# ALTERNATE USES

## Form A

Paul R. Christensen, J. P. Guilford, Philip R. Merrifield and Robert C. Wilson

NAME \_\_\_\_\_ SEX: M \_\_\_\_\_ SCORES: I \_\_\_\_\_  
F \_\_\_\_\_ II \_\_\_\_\_  
Total III \_\_\_\_\_  
GROUP \_\_\_\_\_ DATE \_\_\_\_\_

In this test, you will be asked to consider some common objects. Each object has a common use, which will be stated. You are to list as many as six other uses for which the object or parts of the object could serve.

### EXAMPLE:

Given: A NEWSPAPER (used for reading). You might think of the following other uses for a newspaper.

- a. start a fire
- b. wrap garbage
- c. swat flies
- d. stuffing to pack boxes
- e. line drawers or shelves
- f. make up a kidnap note

Notice that all of the uses listed are different from each other and different from the primary use of a newspaper. Each acceptable use must be different from others and from the common use.

Do not spend too much time on any one item. Write down those uses that occur to you and go on to the others in the same Part. You may return to the incomplete items in a Part if time for that Part permits.

There are three parts to this test, with three items per part. You will have 4 minutes for each part.

If you have any questions, ask them now.

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

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## PART I

List as many as six possible uses for each of the following objects:

1. SHOE (used as footwear)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_

2. BUTTON (used to fasten things)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_

3. KEY (used to open a lock)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

## PART II

List as many as six possible uses for each of the following objects:

4. CHAIR (used for sitting)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_

5. WATCH (used for telling time)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_

6. SAFETY PIN (used for fastening)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

### PART III

List as many as six possible uses for each of the following objects:

7. WOODEN PENCIL (used for writing)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_

8. AUTOMOBILE TIRE (used on the wheel of an automobile)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_

9. EYEGLASS (used to improve vision)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_
- f. \_\_\_\_\_

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.



## **APPENDIX D**

### **A DETAILED SCORING GUIDE OF GUILFORD'S ALTERNATE USES TEST FORM A**

## A Detailed Scoring Guide of Guilford's Alternate Uses Test

From experience in scoring this kind of a test, a number of rules have been adopted. These rules are given below, followed by specific examples of acceptable and unacceptable responses to items.

1. The scorer should mark all responses (stated use) either acceptable (1) or unacceptable (0).

2. A use, to be acceptable, should be possible for the object. For example, stating that an automobile tire can be used as a ring for the finger is unacceptable under this rule.

3. An acceptable use must be different from the given use, i. e., it must not fall within the class of the given, common use. The scorer should tend to leniency in this regard, however, a response being ruled out only if it is clearly only a modification of the given use. Saying that a milk carton can be used to 'hold orange juice' is not sufficiently different from 'used to hold milk,' which is given. On the other hand, the use 'to mix paints in' involves more than the idea of containing and therefore qualifies.

4. Where the same idea of use may fit more than one object, e. g., 'as a weapon' or 'to burn,' credit should be given for each response unless some use is obviously overworked, particularly with the same wording.

5. Vague or very general uses are not acceptable. Examples of such responses are listed below. Note, however, that some seemingly vague responses are listed as acceptable. This is for the reason that they pertain to some unusual, specific attribute of the object.

6. A use that pertains to any conceivable interpretation of the object is acceptable. For example, 'shoe' is not only footwear; it may also be part of a brake. A 'button' not only appears on clothing, it can be symbol as for a campaign or a club. A 'key' not only unlocks doors; it may belong to a test or a map.

### Lists of Responses\*

The lists of uses for the various items have accumulated in experiences

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\*Credit for compiling these lists should be given to Mrs. Anne B. Cox, Sheldon Gardner, and Kazuo Nihiri.

with the Unusual Uses test. They are meant to serve as guides, not to be followed unquestionably. The scorer may find occasional responses that are acceptable under the rules that do not appear in the list. Under the rules, some responses, although listed, should not be given credit, for example duplicating uses.

Examples of responses that are too vague to be accepted:

To have fun with	As a game
To break	To use the parts
To make something	To throw it (except shoe)
As a weapon (except shoe, chair safety pin)	To hit with (except shoe, chair)
To throw away	To burn (except chair)
	To get

Examples, Item by Item:

1. SHOE (used as footwear)

Acceptable

To crush bugs	As a hammer
Tie on car after wedding	Drink champagne out of
To hit someone with	For a paper weight
For dog to chew on	Stamp out cigars (cigarettes)
Hide money in	Ash tray
Put out fires	Keep socks in
To measure in feet	To throw at cat (dog; but not both)

Unacceptable

To kick people	Shoe a horse (footwear)
Walk on	Use as leather
Fix them	Polish them

2. BUTTON (used to fasten things)

Acceptable

To draw circles	Make eyes on a doll (or nose; but not both)
Use as checkers	Add to a collection
Put in necklace	Make a twirler
Use in slingshot	Play tiddley winks
A marker for golf	As a charm
Book mark	As an emblem
To suck on (to avoid thirst)	

Unacceptable

Melt to use plastic  
Throw at people

Use as a toy (too vague)

3. KEY (used to open a lock)

Acceptable

Open cans (e.g., coffee)  
For cleaning nails  
As screw driver  
To score a test  
Shows membership in a club

Jar opener  
To decorate wall  
Electrical connection  
Explain a map

Unacceptable

To start a car  
To jingle in pocket

To kill someone

4. CHAIR (used for sitting)

Acceptable

Use as a desk (table; but not both)  
As a doorstep  
Wood for fire

Tame lion (or other Animal)  
Weapon in the movies  
To stand on to reach something

Unacceptable

Something to paint

To stand on (too vague)

5. WATCH (used for telling time)

Acceptable

Band for a bracelet  
As a compass (to tell South from  
the sun)

To start fires  
Paperweight  
As a decoration

Unacceptable

To tell people time

To wear

6. SAFETY PIN (used for fastening)

Acceptable

To take out a cork  
As a fish hook  
As a weapon  
To take out splinters

As a key ring  
To clean fingernails  
To open skin blisters  
To make a foxhole radio tuner

Unacceptable

As a paper clip (also a fastener)

7. MILK CARTON (used to hold milk)

Acceptable

To keep plants in  
Emergency baby toilet  
To make puppets

To start fires  
To mix paints in  
Mold for candles, etc.

Unacceptable

To hold water  
To hold orange juice

For grease  
Throw away

8. AUTOMOBILE TIRE (used on wheel of automobile)

Acceptable

As a hula hoop  
As a swing  
Walls for a flower bed

As a raft  
Bumper (one use only)

Unacceptable

As a ring (for finger)

9. EYEGLASSES (used to improve vision)

Acceptable

Protection from being hit  
Hide a hearing aid  
Change your personality

Improve appearance  
As a disguise  
To start a fire

## Unacceptable

To magnify things  
To wreck your eyes

To see people coming

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